

Appendix (II)-5 Micro Forecast

1. Import commodities

(1) Dry Bulk

1) Wheat

- A. Cultivated area forecast
- B. Yield rate forecast
- C. Production forecast
- D. Consumption per capita forecast
- E. Total consumption forecast
- F. Import forecast

2) Barley

3) Corn

(2) Liquid bulk

1) Petroleum Products

2) Vegetable Oil

(3) Bag Cargo

1) Fertilizers

2) Sugar

3) Rice

4) Soy Bean

(4) Refrigerated Goods

1) Meat

(5) Steel Material

1) Metallic Product

(6) Mineral

1) Coal

(7) General Cargo

1) Container cargo

2) Others

1. Import Commodities

(1) Dry Bulk

Among all the commodities handled at the seven ports, cereal is the largest cargo in terms of volume as shown in Table A-3.5.3 - 1, and a major question is whether Iran will increase imports of cereal in the future. Iran's agricultural policy, meteorological conditions and other factors must be taken into account when considering this question.

The major imported cereals are wheat and barley as food staples and maize for the materials of animal feed. So in forecasting the volume of imported cereals, these different types of cereal must be considered.

The method of forecasting the volume of imported cereals consists of first determining the nation's domestic demand and production, then the difference between the demand and production will be assumed as the nation's import needs. The future values of domestic demand are determined using the data on the future population forecast and per capita consumption. The future values of domestic production are determined using the future area under cultivation and the future yield per unit area. Finally, volume of cereals unloaded at the study ports are determined taking account of the share of population in the hinterland, capacity of silo and other factors.

1) Wheat

Table A-3.5.3 - 2 and Figures A-3.5.3 - 1, - 2 and - 3 indicate the cultivated area, yield rate and total production of wheat in Iran from 1976 to 1992. Cultivated area has clearly increased from 1979 to 1987. The yield rates of the latest three year shows a notable increase. Total production fluctuated year by year from 1976 to 1989, but shows a tendency to increase. Future production is estimated by multiplying the future cultivated area by the future yield rate, which are predicted from the average growth rate from 1976-1992.

A. Cultivated area forecast

Figure A-3.5.3 - 1 shows the national cultivated area of wheat from 1976 to 1992. Since 1979 the cultivated area has tended to increase due to the agricultural policy of the Iranian government. It is assumed that the cultivated area in the future will increase at the same rate as it has since 1976 and the forecast area for the target years is as shown below.

	2000/01	2010/11
Cultivated area (thousand ha)	6,469	6,790

B. Yield rate forecast

As shown in Figure A-3.5.3 - 2, the yield rate of wheat has fluctuated annually,

Table A-3.5.3-1 The handling unloaded volume of each commodity at the seven ports.

COMMODITY	Unit: 1,000 tons											
	1988/89		1989/90		1990/91		1991/92		1992/93		1993/94	
	tons	ratio	tons	ratio	tons	ratio	tons	ratio	tons	ratio	tons	ratio
DRY BULK	3,648	29.4%	5,607	34.4%	4,729	24.5%	4,149	19.5%	4,265	19.6%	3,767	16.6%
Barley	114	0.9%	600	3.7%	446	2.3%	198	0.9%	152	0.7%	264	1.2%
Wheat	2,998	24.1%	4,219	25.9%	3,438	17.8%	2,914	13.7%	2,923	13.4%	2,691	11.9%
Corn	536	4.3%	788	4.8%	845	4.4%	1,037	4.9%	1,190	5.5%	812	3.6%
LIQUID BULK	4,521	36.4%	3,485	21.4%	3,927	20.3%	4,786	22.5%	5,524	25.4%	7,536	33.3%
Petroleum Products	4,204	33.8%	3,006	18.5%	3,478	18.0%	4,292	20.2%	5,014	23.1%	6,923	30.6%
Vegetable Oil	317	2.6%	479	2.9%	449	2.3%	494	2.3%	510	2.3%	613	2.7%
BAG CARGO	1,927	15.5%	2,910	17.9%	2,300	11.9%	2,022	9.5%	4,069	18.7%	2,702	11.9%
Fertilizers	1,090	8.8%	1,360	8.4%	662	3.4%	716	3.4%	1,239	5.7%	590	2.6%
Chemical Material	0		0		0		0		745	3.4%	449	2.0%
Sugar	269	2.2%	502	3.1%	584	3.0%	487	2.3%	633	2.9%	344	1.5%
Rice	253	2.0%	772	4.7%	643	3.3%	498	2.3%	866	4.0%	786	3.5%
Soy Bean	315	2.5%	276	1.7%	411	2.1%	321	1.5%	586	2.7%	533	2.4%
CONTAINER												
Others	101	0.8%	224	1.4%	616	3.2%	546	2.6%	658	3.0%	562	2.5%
REFRIGERATED GOODS												
Meat	84	0.7%	62	0.4%	27	0.1%	65	0.3%	68	0.3%	83	0.4%
STEEL MATERIAL												
Metalic Product	624	5.0%	845	5.2%	3,861	20.0%	5,026	23.6%	3,067	14.1%	3,057	13.5%
MINERAL												
Coal	140	1.1%	280	1.7%	551	2.9%	618	2.9%	587	2.7%	830	3.7%
GENERAL CARGO												
Others	1,384	11.1%	2,864	17.6%	3,292	17.1%	4,048	19.0%	3,510	16.1%	4,114	18.2%
T O T A L	12,429	100%	16,277	100%	19,303	100%	21,260	100%	21,748	100%	22,651	100.0%

Source: Ports & Shipping Organization

Table A-3.5.3-2. Wheat

Wheat

	Cultivated Area (hectares)	Production (tons)	Yield Rate (kg/ha)	PSO IMPORT tons	Consumption Prod. + Imprt. tons	Population persons	Consumption In kg/inhabi. per year
1976	5,759,000	6,044,000	1,049	1,120,000	7,164,000	33,709,000	212.5
1977	5,451,000	5,517,000	1,012	1,119,000	6,636,000	34,992,000	189.6
1978	5,442,000	5,660,000	1,040	1,119,000	6,779,000	36,332,000	186.6
1979	5,352,000	6,025,000	1,126	1,119,000	7,144,000	37,731,000	189.3
1980	5,954,000	5,850,000	983	1,415,000	7,265,000	39,192,000	185.4
1981	6,124,000	6,610,000	1,079	1,789,000	8,399,000	40,718,000	206.3
1982	6,192,000	6,660,000	1,076	2,262,000	8,922,000	42,313,000	210.9
1983	6,042,000	5,956,000	986	2,301,000	8,257,000	43,979,000	187.7
1984	5,959,000	6,207,000	1,042	2,299,000	8,506,000	45,721,000	186.0
1985	6,195,000	6,631,000	1,070	2,598,000	9,229,000	47,385,000	194.8
1986	6,304,000	7,556,000	1,199	2,934,000	10,490,000	49,445,000	212.2
1987	6,591,000	7,600,000	1,153	3,315,000	10,915,000	51,073,000	213.7
1988	6,553,000	7,265,000	1,109	2,998,000	10,263,000	52,779,000	194.5
1989	6,257,000	6,010,000	961	4,219,000	10,229,000	54,364,000	188.2
1990	6,278,000	8,012,000	1,276	3,438,000	11,450,000	55,869,000	204.9
1991	6,193,000	8,793,000	1,420	2,914,000	11,707,000	57,234,000	204.5
1992	6,223,070	8,791,901	1,413	2,923,000	11,714,901	58,574,000	200.0
1993	6,253,286	9,000,263	1,439	2,691,000	11,691,263	59,946,000	195.0
1994	6,283,649	9,213,562	1,466	2,933,540	12,147,102	61,349,000	198.0
1995	6,314,159	9,431,917	1,494	2,999,711	12,431,628	62,786,000	198.0
1996	6,344,817	9,655,447	1,522	3,067,241	12,722,688	64,256,000	198.0
1997	6,375,624	9,884,274	1,550	3,136,206	13,020,480	65,760,000	198.0
1998	6,406,581	10,118,524	1,579	3,206,876	13,325,400	67,300,000	198.0
1999	6,437,687	10,358,326	1,609	3,233,582	13,591,908	68,646,000	198.0
2000	6,468,945	10,603,810	1,639	3,259,952	13,863,762	70,019,000	198.0
2001	6,500,355	10,855,113	1,670	3,285,849	14,140,962	71,419,000	198.0
2002	6,531,918	11,112,371	1,701	3,311,533	14,423,904	72,848,000	198.0
2003	6,563,633	11,375,727	1,733	3,336,663	14,712,390	74,305,000	198.0
2004	6,595,503	11,645,323	1,766	3,361,295	15,006,618	75,791,000	198.0
2005	6,627,527	11,921,309	1,799	3,385,477	15,306,786	77,307,000	198.0
2006	6,659,707	12,203,835	1,832	3,409,059	15,612,894	78,853,000	198.0
2007	6,692,043	12,493,057	1,867	3,432,083	15,925,140	80,430,000	198.0
2008	6,724,536	12,789,134	1,902	3,454,390	16,243,524	82,038,000	198.0
2009	6,757,186	13,092,227	1,938	3,476,215	16,568,442	83,679,000	198.0
2010	6,789,996	13,402,503	1,974	3,497,391	16,899,894	85,353,000	198.0

Figure A-3.5.3-1 Cultivated Area

Unit: 1,000,000 ha

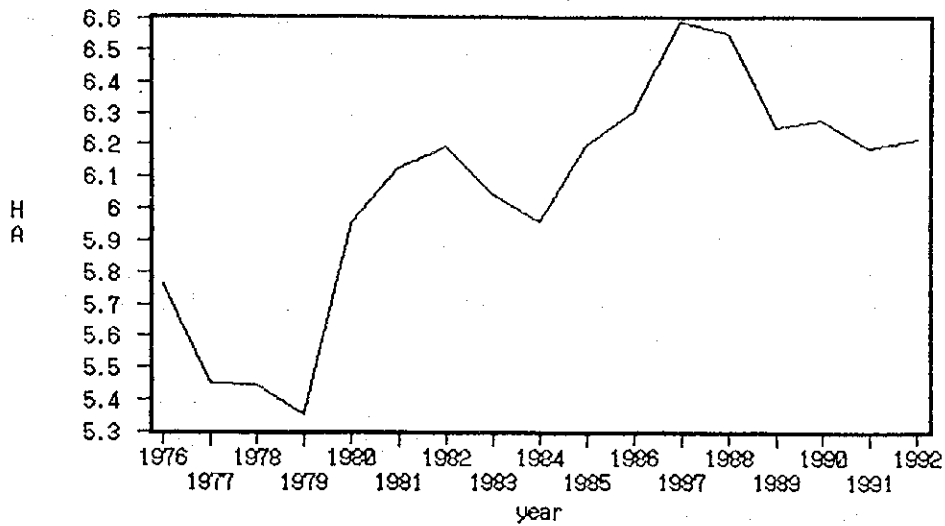


Figure A-3.5.3-2 Yield Rate

Unit: 1,000 kg/ha

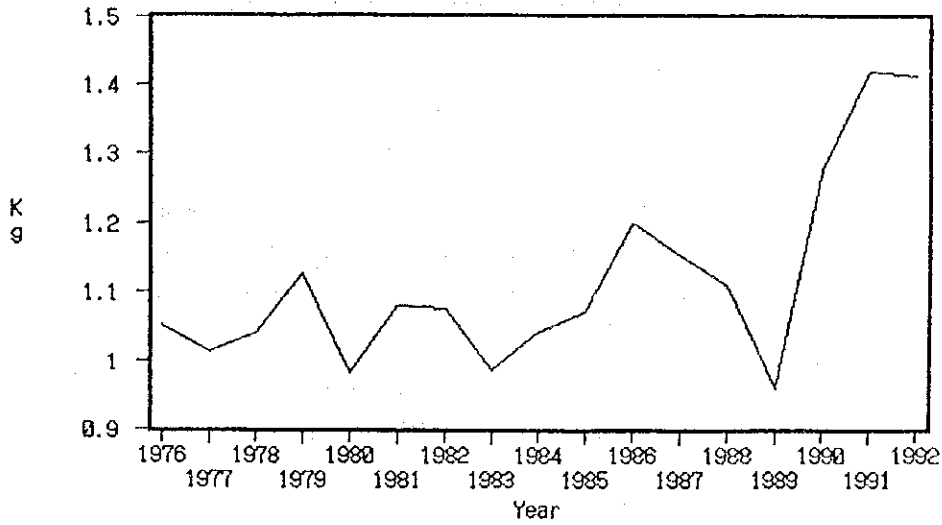
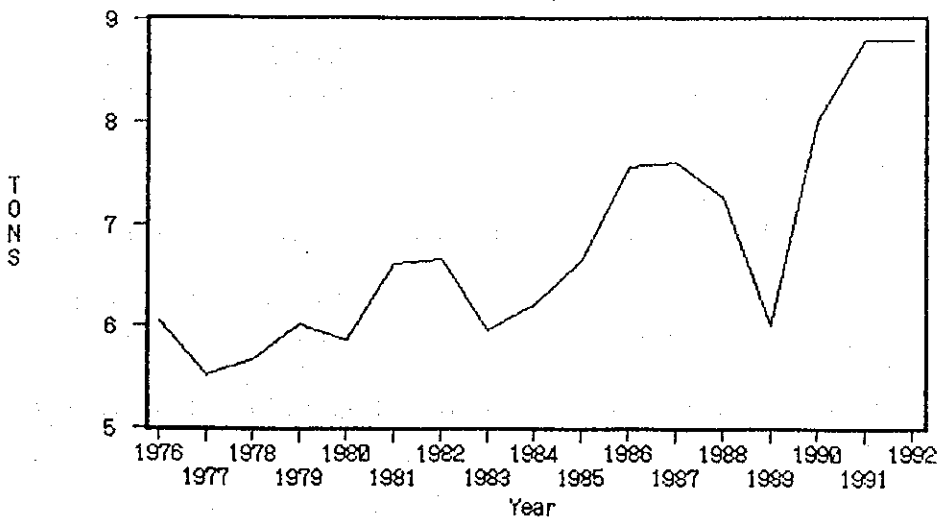


Figure A-3.5.3-3 Production

Unit: 1,000,000 tons



though it has tended to increase. Assuming that the yield rate will increase at the same pace in the future, the estimated yield rate for the target years is;

	2000/01	2010/11
Yield rate (kg/ha)	1,639	1,974

C. Production forecast

Production of wheat in the target years is obtained by multiplying the forecast cultivated area by the yield rate.

	2000/01	2010/11
Production (thousand tons)	10,604	13,403

D. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by total population. So, per capita consumption can be expressed as;

$$(P + I) / \text{Population}$$

where

P: Total Production

I: Import volume

Table A-3.5.3 - 2 lists the data for calculating per capita consumption of wheat from 1976 to 1993. Because it is fluctuating annually and doesn't show a clear growth tendency, we have adopted the average value from 1976 to 1993 as the future per capita consumption.

	2000/2010
Consumption per capita	198 kg/capita

E. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1-(1).

	2000/01	2010/11
Total consumption (thousand tons)	13,864	16,900

F. Import forecast

From C and E, the total deficit(import) in the target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	3,260	3,497

Of the total cereal imports, the volume to be handled at each study port will be estimated later.

2) Barley

Table A-3.5.3 - 3 and Figures A-3.5.3 - 4, - 5 and - 6 indicate the cultivated area, yield rate and total production of barley in Iran from 1976 to 1992. Cultivated area has clearly increased from 1979 to 1987. The yield rates of the latest three years shows a notable increase. Total production is fluctuating year by year from 1976 to 1989, but shows a tendency to increase. Future production is estimated by multiplying the future cultivated area by the future yield rate, which are predicted from the average growth rate from 1976-1992.

A. Cultivated area forecast

Figure A-3.5.3 - 4 shows the national cultivated area of barley from 1976 to 1992. Since 1979 cultivated area has tended to increase due to the agricultural policy of the Iranian government. It is assumed that the cultivated area in the future will increase at the same rate as it has since 1979 and the forecast area for the target years is as shown below.

	2000/01	2010/11
Cultivated area (thousand ha)	2,542	2,650

B. Yield rate forecast

As shown in Figure A-3.5.3 - 5, the yield rate of barley has fluctuated annually, though has tended to increase. Assuming that the yield rate will increase at the same pace in the future, the estimated yield rate for the target years is;

	2000/01	2010/11
Yield rate (kg/ha)	1,700	2,010

C. Production forecast

Production of barley in the target years is obtained by multiplying the forecast cultivated area by the yield rate.

	2000/01	2010/11
Production (thousand tons)	4,322	5,326

D. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by total population. So per capita consumption can be expressed as;

$$(P + I) / \text{Population}$$

where

P: Total Production

I: Import volume

Table A-3.5.3-3 Barley

Barley

year	Cultivated Area hectares	Production tons	Yield in kg/ha	PSO IMPORT tons	Consumption Prod.+Imprt. tons	Population persons	Consumption In kg/inhabi. per year
1976	1,306,000	1,487,000	1,139	248,000	1,735,000	33,709,000	51.5
1977	1,278,000	1,230,000	962	272,000	1,502,000	34,992,000	42.9
1978	1,177,000	1,217,000	1,034	299,000	1,516,000	36,332,000	41.7
1979	1,255,000	1,353,000	1,078	329,000	1,682,000	37,731,000	44.6
1980	1,577,000	1,353,000	858	383,000	1,736,000	39,192,000	44.3
1981	1,565,000	1,700,000	1,086	447,000	2,147,000	40,718,000	52.7
1982	1,841,000	1,903,000	1,034	521,000	2,424,000	42,313,000	57.3
1983	2,007,000	2,034,000	1,013	564,000	2,598,000	43,979,000	59.1
1984	2,163,000	2,293,000	1,060	540,000	2,833,000	45,721,000	62.0
1985	2,084,000	2,297,000	1,102	357,000	2,654,000	47,385,000	56.0
1986	1,973,000	2,505,000	1,270	236,000	2,741,000	49,445,000	55.4
1987	2,220,000	2,731,000	1,230	156,000	2,887,000	51,073,000	56.5
1988	2,576,000	3,394,000	1,318	114,000	3,508,000	52,779,000	66.5
1989	2,651,000	2,847,000	1,074	600,000	3,447,000	54,364,000	63.4
1990	2,506,000	3,360,000	1,341	446,000	3,806,000	55,869,000	68.1
1991	2,363,000	3,196,000	1,353	198,000	3,394,000	57,234,000	59.3
1992	2,458,282	3,657,000	1,488	152,000	3,809,000	58,574,000	65.0
1993	2,468,560	3,734,175	1,513	264,000	3,998,175	59,946,000	66.7
1994	2,478,880	3,812,979	1,538	174,706	3,987,685	61,349,000	65.0
1995	2,489,244	3,893,446	1,564	187,644	4,081,090	62,786,000	65.0
1996	2,499,651	3,975,611	1,590	201,029	4,176,640	64,256,000	65.0
1997	2,510,101	4,059,510	1,617	214,890	4,274,400	65,760,000	65.0
1998	2,520,595	4,145,180	1,645	229,320	4,374,500	67,300,000	65.0
1999	2,531,133	4,232,658	1,672	229,332	4,461,990	68,646,000	65.0
2000	2,541,715	4,321,981	1,700	229,254	4,551,235	70,019,000	65.0
2001	2,552,342	4,413,190	1,729	229,045	4,642,235	71,419,000	65.0
2002	2,563,012	4,506,323	1,758	228,797	4,735,120	72,848,000	65.0
2003	2,573,728	4,601,422	1,788	228,403	4,829,825	74,305,000	65.0
2004	2,584,488	4,698,528	1,818	227,887	4,926,415	75,791,000	65.0
2005	2,595,293	4,797,683	1,849	227,272	5,024,955	77,307,000	65.0
2006	2,606,143	4,898,931	1,880	226,514	5,125,445	78,853,000	65.0
2007	2,617,039	5,002,315	1,911	225,635	5,227,950	80,430,000	65.0
2008	2,627,980	5,107,881	1,944	224,589	5,332,470	82,038,000	65.0
2009	2,638,967	5,215,675	1,976	223,460	5,439,135	83,679,000	65.0
2010	2,650,000	5,325,744	2,010	222,201	5,547,945	85,353,000	65.0

Figure A-3.5.3-4 Cultivated Area

Unit: 1,000,000 ha

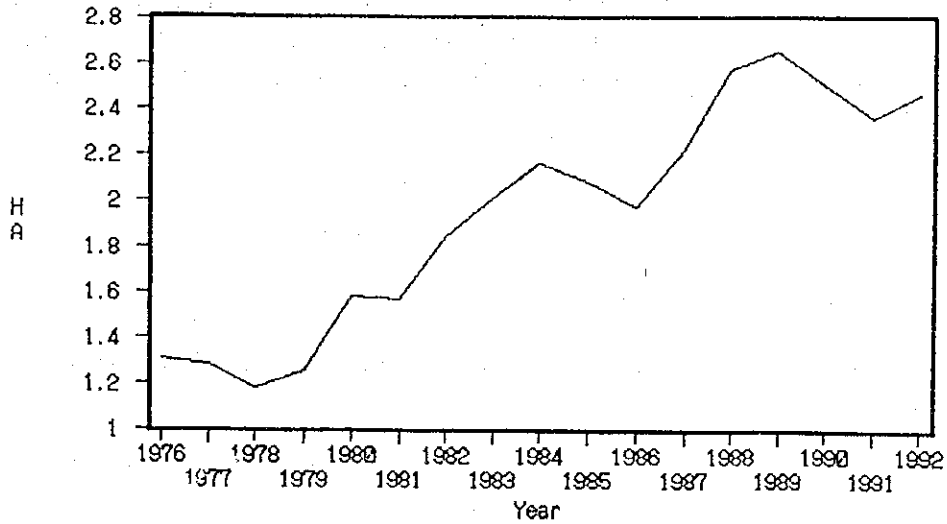


Figure A-3.5.3-5 Yield Rate

Unit: 1,000 kg

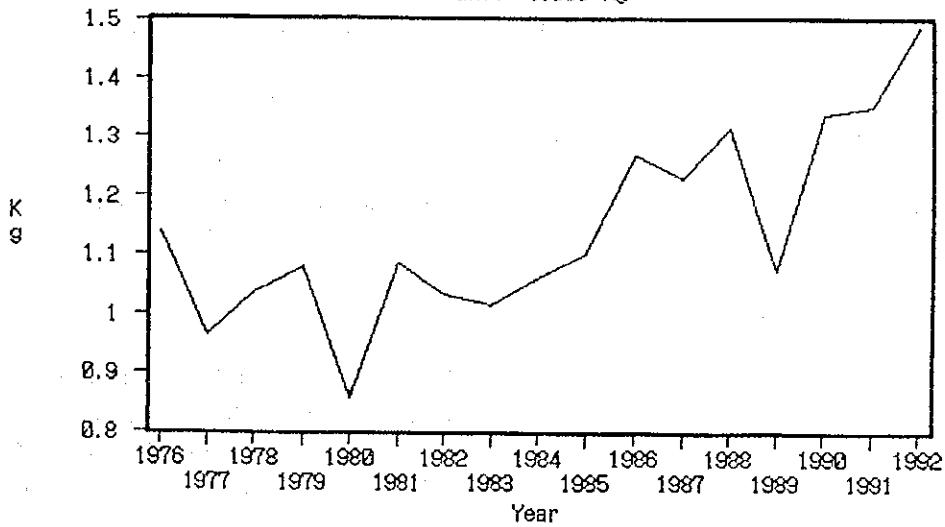


Figure A-3.5.3-6 Production

Unit: 1,000,000 tons

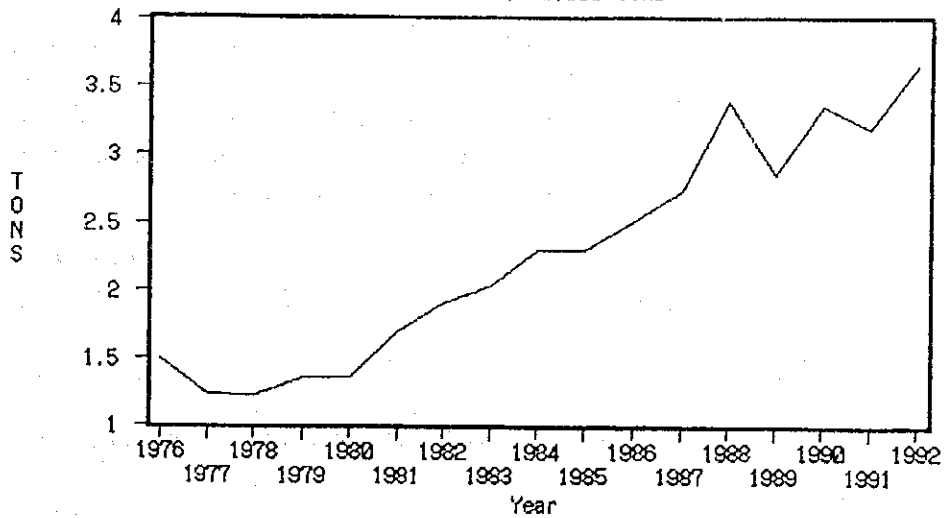


Table A-3.5.3 - 3 lists the data for calculating per capita consumption of barley from 1976 to 1993. Because it is fluctuating annually and doesn't show a clear growth tendency, we have adopted the average value from 1988 - 1993 as the future per capita consumption.

Consumption per capita	2000/2010 65 kg/capita
------------------------	---------------------------

E. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1.

	2000/01	2010/11
Total consumption (thousand tons)	4,551	5,548

F. Import forecast

From C and E, the total deficit(import) in the target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	229	222

Of the total cereal imports, the volume to be handled at the each study port will be estimated later.

3) Corn

Table A-3.5.3 - 4 and Figures A-3.5.3 - 7, - 8 and - 9 indicate the cultivated area, yield rate and total production of corn in Iran from 1990 to 1992. Cultivated area, yield rate and total production have clearly increased from 1990 to 1992. Future production is estimated by multiplying the future cultivated area by the future yield rate.

A. Cultivated area forecast

Figure A-3.5.3 - 7 shows the national cultivated area of corn from 1990 to 1992. The data before 1990 was not available but since then there has been a clear tendency to increase. It is assumed that the cultivated area in the future will increase at least at the same growth rate as agriculture sector from 1992 which is estimated in chapter 3.3. The forecast area for the target years is as shown below.

	2000/01	2010/11
Cultivated area (thousand ha)	78	121

B. Yield rate forecast

As shown in Figure A-3.5.3 - 8, the yield rate of corn is increasing year by year.

Table A-3.5.3-4 Corn

Corn

Year	Cultivated Area (hectares)	Production (tons)	Yield in kg/ha	PSO IMPORT tons	Consumption Prod. + Imprtl tons	Population persons	Consumption In kg/inhabi. per year
1976				313,000	313,000	33,709,000	9.3
1977				416,000	416,000	34,992,000	11.9
1978				554,000	554,000	36,332,000	15.2
1979				738,000	738,000	37,731,000	19.6
1980				753,000	753,000	39,192,000	19.2
1981				767,000	767,000	40,718,000	18.8
1982				782,000	782,000	42,313,000	18.5
1983				882,000	882,000	43,979,000	20.1
1984				869,000	869,000	45,721,000	19.0
1985				891,000	891,000	47,385,000	18.8
1986				914,000	914,000	49,445,000	18.5
1987				938,000	938,000	51,073,000	18.4
1988				536,000	536,000	52,779,000	10.2
1989				788,000	788,000	54,364,000	14.5
1990	38,000	131,000	3,447	845,000	976,000	55,869,000	17.5
1991	42,000	188,000	4,476	1,037,000	1,225,000	57,234,000	21.4
1992	55,000	4.50%	300,000	5,455	1,190,000	58,574,000	25.4
1993	57,475	313,526	5,455	812,000	1,125,526	59,946,000	18.8
1994	60,061	327,635	5,455	948,424	1,276,059	61,349,000	20.8
1995	62,764	342,378	5,455	963,570	1,305,949	62,786,000	20.8
1996	65,589	357,785	5,455	978,739	1,336,525	64,256,000	20.8
1997	68,540	373,886	5,455	993,922	1,367,808	65,760,000	20.8
1998	71,624	390,711	5,455	1,009,129	1,399,840	67,300,000	20.8
1999	74,847	408,293	5,455	1,019,544	1,427,837	68,646,000	20.8
2000	78,216	426,666	5,455	1,029,729	1,456,395	70,019,000	20.8
2001	81,735	445,866	5,455	1,039,650	1,485,515	71,419,000	20.8
2002	85,413	465,930	5,455	1,049,309	1,515,238	72,848,000	20.8
2003	89,257	486,896	5,455	1,058,648	1,545,544	74,305,000	20.8
2004	93,273	508,807	5,455	1,067,646	1,576,453	75,791,000	20.8
2005	97,471	531,703	5,455	1,076,282	1,607,986	77,307,000	20.8
2006	101,857	555,630	5,455	1,084,513	1,640,142	78,853,000	20.8
2007	106,441	580,633	5,455	1,092,311	1,672,944	80,430,000	20.8
2008	111,230	606,762	5,455	1,099,629	1,706,390	82,038,000	20.8
2009	116,236	634,066	5,455	1,106,457	1,740,523	83,679,000	20.8
2010	121,466	662,599	5,455	1,112,744	1,775,342	85,353,000	20.8

Figure A-3.5.3-7 Cultivated area
Unit: 1,000 ha

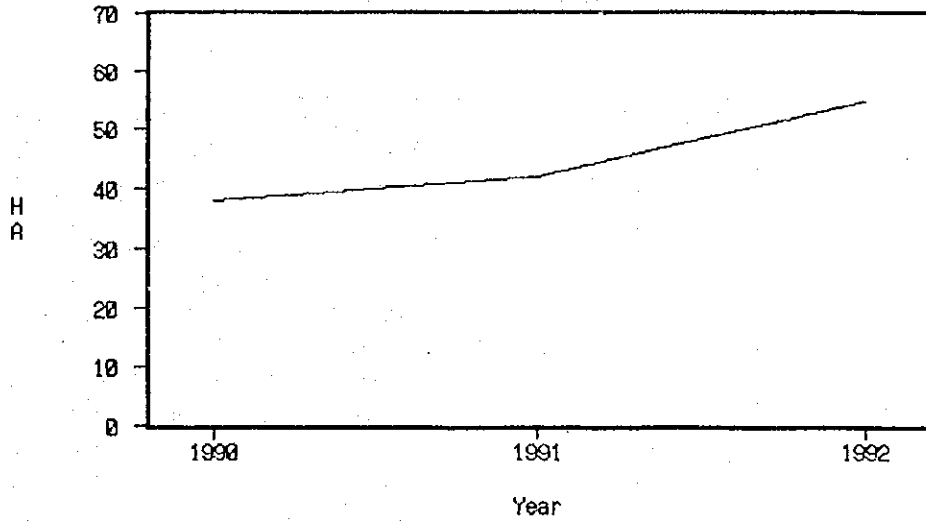


Figure A-3.5.3-8 Yield Rate
Unit: 1,000 kg/ha

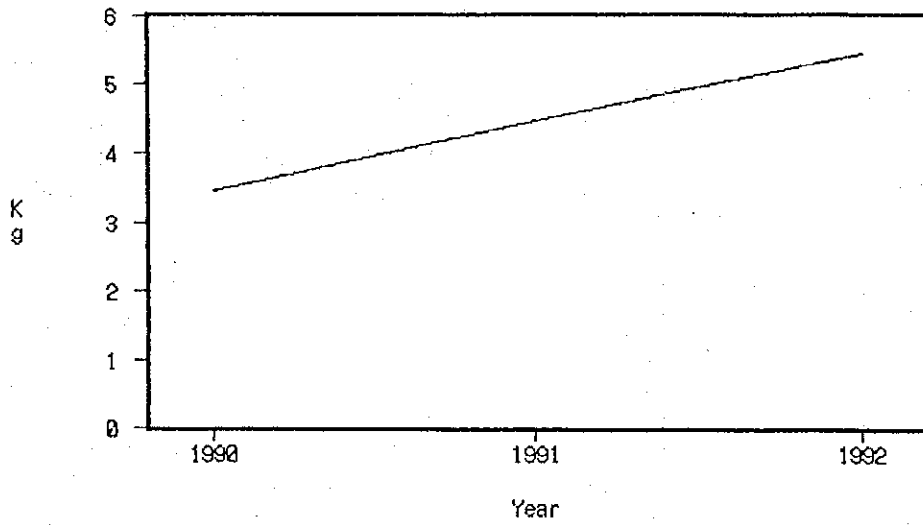
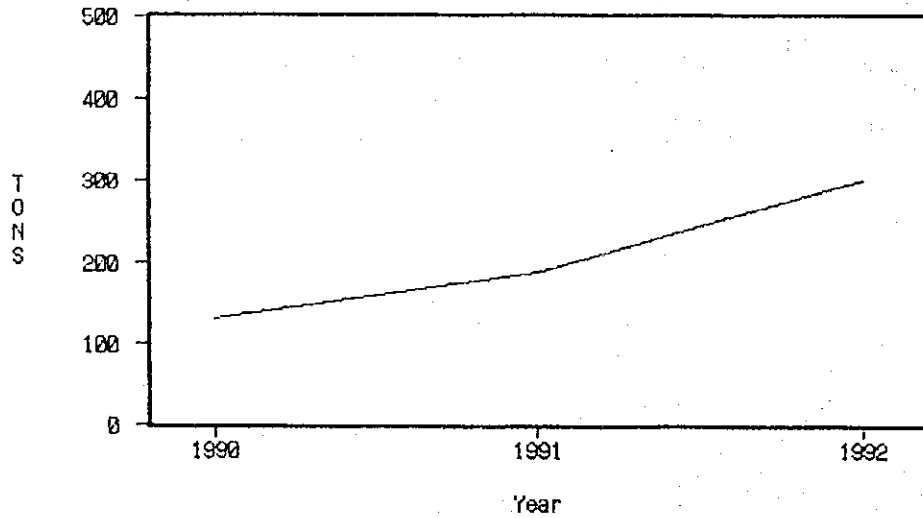


Figure A-3.5.3-9 Production
Unit: 1,000 tons



Assuming that the yield rate will maintain the same rate of 1992 in the future, the estimated yield rate for the target years is;

	2000/01	2010/11
Yield rate (kg/ha)	5,455	5,455

C. Production forecast

Production of corn in the target years is obtained by multiplying the forecast cultivated area by the yield rate.

	2000/01	2010/11
Production (thousand tons)	427	663

D. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by total population. So per capita consumption can be expressed as;

$$(P + I) / \text{Population}$$

where

P: Total Production
I: Import volume

Table A-3.5.3 - 4 lists the data for calculating per capita consumption of corn from 1976 to 1993. Because it is fluctuating annually and doesn't show a clear growth tendency, we have adopted the average value from 1990 - 1993 as the future per capita consumption.

	2000/01	2010/11
Consumption per capita (kg/capita)	20.8	20.8

E. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1.

	2000/01	2010/11
Total consumption (thousand tons)	1,456	1,775

F. Import forecast

From C and E, the total deficit(import) in the target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	1,030	1,113

The volume to be handled at each study port will be estimated later.

(2) Liquid Bulk

Among all the commodities handled at seven ports, liquid bulk such as petroleum product and vegetable oil is the largest cargo in terms of volume as shown in Table A-3.5.3-1. In general, the aforesaid cargo handling volume of a port has a close relation with GDP(gross domestic product). In this section, the total cargo volume handled at the eleven ports will be forecasted based on the correlation between the past handling cargoes and GDP.

1) Petroleum Products

A. Import forecast

As shown in Figure A-3.5.3 - 10, the import volume of petroleum products has clearly increased annually from 1989 to 1993. We assume that the import volume will increase at the same pace in the future.

The import volume of petroleum products is forecasted by its relation with annual growth rate of GDP. Table A-3.5.3 - 5 indicate that the average growth rates from 1992-2000 and 2000-2010 are 5.67% and 5.26% respectively; by multiplying these rates from 1993-2010 by the import volume from 1992 to 2010, the import volume in the target years is calculated as shown below.

	2000/01	2010/11
Import volume (thousand tons)	7,713	9,000

2) Vegetable Oil

A. Import forecast

As shown in Figure A-3.5.3 - 11, the import volume of vegetable oil has clearly increased year by year from 1989 to 1993. We assume that the import volume will increase at the same pace in the future.

The import volume of vegetable oil is forecasted by its relation with annual growth rate of GDP. Table A-3.5.3 - 6 indicate that the average growth rates from 1993-2000 and 2000-2010 are 5.52% and 5.26% respectively; by multiplying these rates from 1993-2010 by the import volume from 1993-2010, the import volume in the target years is calculated as shown below.

	2000/01	2010/11
Import volume (thousand tons)	893	1,491

(3) Bag Cargo

The major imported bag cargoes are fertilizers as the chemical products and sugar, rice and soy bean as food staples. So in forecasting the volume of imported bag cargo, these different types of bag cargo must be considered.

Figure A-3.5.3-10 Import Petroleum Product

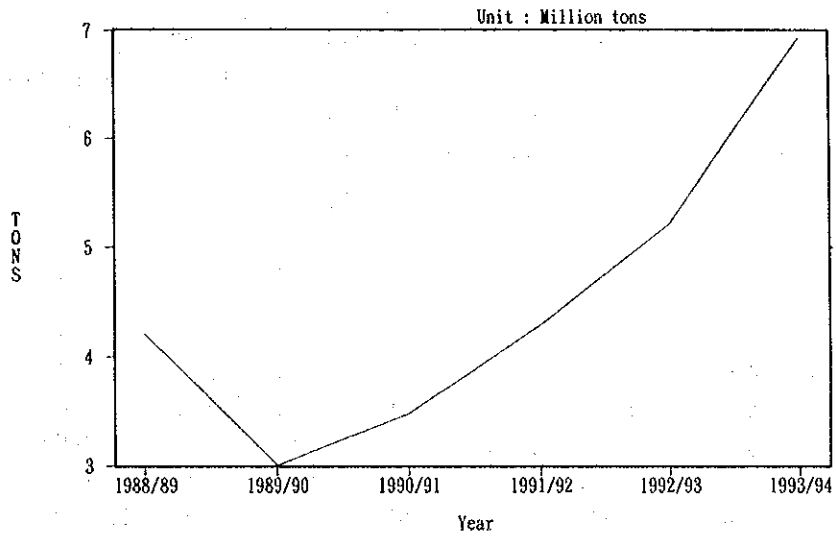


Table A-3.5.3-5 Petroleum Products Forecast

year	Total Products (1000 tons)		Import (1000 tons)		Consumption (1000 tons)		GDP (Billion IRL)		GDP per Capita (Thousand IRL)	
		Growth Rate		Growth Rate		Growth Rate		Av. Growth Rate		Av. Growth Rate
1981	28,134									
1982										
1983										
1984										
1985										
1986	33,864									
1987	33,632	-0.69%					10,368		203	
1988	35,609	5.88%	4,204		39,813		9,468	-8.68%	179	-11.63%
1989	46,312	30.06%	3,006	28.50%	49,318	23.87%	9,782	3.32%	180	0.30%
1990	47,573	2.72%	3,478	15.70%	51,051	3.51%	10,930	11.74%	196	8.73%
1991	54,727	15.04%	4,292	23.40%	59,019	15.61%	12,181	11.45%	213	8.79%
1992	55,914	2.17%	5,211	21.41%	61,125	3.57%	12,911	5.99%	220	3.57%
1993	56,263	0.62%	6,923	32.85%	63,186	3.37%	13,659	5.79%	228	3.37%
1994	58,182	3.41%	7,031	1.56%	65,213	3.21%	14,427		235	3.21%
1995	60,158	3.40%	7,140	1.56%	67,298	3.20%	15,237		243	3.20%
1996	62,201	3.40%	7,251	1.56%	69,452	3.20%	16,093		250	3.20%
1997	64,308	3.39%	7,364	1.56%	71,672	3.20%	16,996	Av. Growth Rate	258	3.20%
1998	66,488	3.39%	7,478	1.56%	73,967	3.20%	17,951		267	3.20%
1999	68,739	3.39%	7,595	1.56%	76,334	3.20%	18,896	(1993-00)	275	3.20%
2000	71,065	3.38%	7,713	1.56%	78,778	3.20%	19,891	5.52%	284	3.20%
2001	73,466	3.38%	7,833	1.56%	81,299	3.20%	20,938		293	3.20%
2002	75,944	3.37%	7,955	1.56%	83,899	3.20%	22,040		303	3.20%
2003	78,505	3.37%	8,078	1.56%	86,583	3.20%	23,200		312	3.20%
2004	81,149	3.37%	8,204	1.56%	89,353	3.20%	24,421		322	3.20%
2005	83,882	3.37%	8,332	1.56%	92,214	3.20%	25,707		333	3.20%
2006	86,703	3.36%	8,461	1.56%	95,164	3.20%	27,060		343	3.20%
2007	89,615	3.36%	8,593	1.56%	98,208	3.20%	28,484		354	3.20%
2008	92,627	3.36%	8,726	1.56%	101,353	3.20%	29,984		365	3.20%
2009	95,733	3.35%	8,862	1.56%	104,595	3.20%	31,562		377	3.20%
2010	98,943	3.35%	9,000	1.56%	107,943	3.20%	33,224	5.26%	389	3.20%

Figure A-3.5.3-11 Vegetable Oil

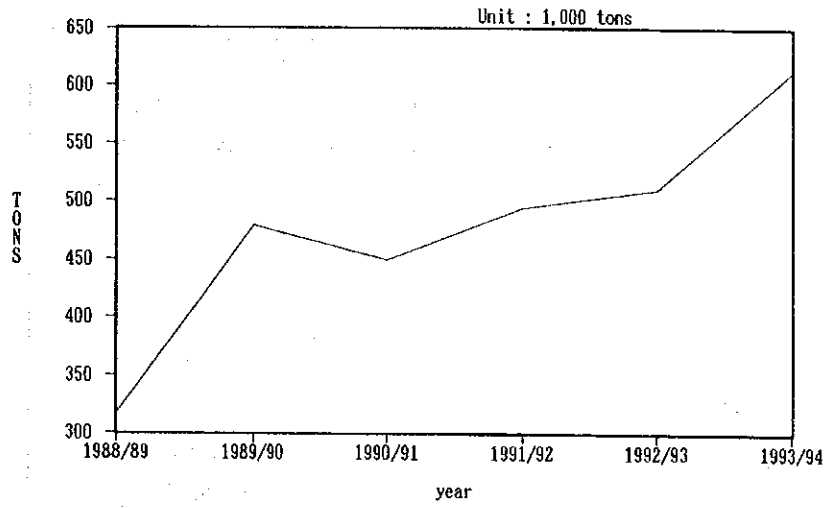


Table A-3.5.3-6 Vegetable Oil

year	Import		GDP	
	(1000 tons)	Ave. Growth Rate	(Bilion IRL)	Ave. Growth Rate
1981/82				
1982/83				
1983/84				
1984/85				
1985/86				
1986/87				
1987/88			10,368	
1988/89	317		9,468	
1989/90	479		9,782	
1990/91	449		10,930	
1991/92	494		12,181	
1992/93	510		12,911	
1993/94	613	14.1%	13,659	
1994/95	647	5.52%	14,427	
1995/96	682	5.52%	15,237	
1996/97	720	5.52%	16,093	
1997/98	760	5.52%	16,996	
1998/99	802	5.52%	17,951	
1999/00	846	5.52%	18,896	
2000/01	893	5.52%	19,891	5.52%
2001/02	940	5.26%	20,938	
2002/03	989	5.26%	22,040	
2003/04	1,041	5.26%	23,200	
2004/05	1,096	5.26%	24,421	
2005/06	1,154	5.26%	25,707	
2006/07	1,214	5.26%	27,060	
2007/08	1,278	5.26%	28,484	
2008/09	1,346	5.26%	29,984	
2009/10	1,416	5.26%	31,562	
2010/11	1,491	5.26%	33,224	5.26%

The method of forecasting the volume of imported fertilizers consists of first determining the nation's domestic demand and production, then the difference between the demand and production will be assumed as the nation's import needs. The future values of domestic demand and production will be forecasted based on the relation with the past data and growth rate of GDP.

The method of forecasting the volume of imported food staples consists of first determining the nation's domestic demand and production, then the difference between the demand and production will be assumed as the nation's import needs. The future values of domestic demand are determined using the data on the future population forecast and per capita consumption. The future values of domestic production are determined using the future area under cultivation and the future yield per unit area. Finally, volume of bag cargo unloaded at the study ports is determined taking account of the share of population in the hinterland, capacity of silo and other factors.

1) Fertilizers

Tables A-3.5.3 - 7 and Figures A-3.5.3 - 12,- 13 and - 14 indicate the production, consumption and import volume of fertilizers in Iran from 1980-1989, 1980-1989 and 1980-1993, respectively. Production volume of fertilizers has clearly increased from 1985 to 1989. Consumption of fertilizers in Iran shows a tendency to increase from 1980 to 1989. The future values of domestic demand are determined using the average growth rate of GDP from 1989 to 2010.

A. Total consumption forecast

Total consumption volume from 1990 to 2000 and from 2001 to 2010 will be calculated by using each average growth rate of GDP from 1989 to 2000 and from 2000 to 2010, respectively mentioned in chapter 3.2.1-(3).

	2000/01	2010/11
Total consumption (thousand tons)	2,401	4,010

B. Production Forecast

The domestic production of fertilizers show a clear growth tendency from 1985 to 1989. Production volume from 1990 to 1992 can be obtained from the total consumption and Import volume. Thereafter the production volume from 1993 to 2000 and from 2001 to 2010 will be calculated by using each average growth rate of GDP from 1992 to 2000 and from 2000 to 2010, respectively mentioned in chapter 3.2.1-(3).

	2000/01	2010/11
Production (thousand tons)	299	499

Table A-3.5.3-7 Fertilizers Forecast

Year	Production Total (tons)		Consumption Total (tons)		Import (tons)	Import PSO Report (tons)	GDP (Blion IRL)		
1976									
1977									
1978									
1979									
1980	101,400		610,200		508,800				
1981	24,000		684,100		660,100				
1982	29,200		888,100		858,900				
1983	27,500		1,023,900		996,400				
1984	13,300		922,000		908,700				
1985	20,000		899,900		879,900				
1986	70,600	Av. Growth	902,900	Av. Growth	832,300				
1987	105,300	Rate	936,400	Rate	831,100		10,368		
1988	117,700	(1980-89)	1,069,900	(1980-89)	952,200	1,090,000	9,468		
1989	357,800	0.1504	1,180,700	0.0761	822,900	1,360,000	9,782		
1990	597,390	66.96%	1,259,390	6.66%		662,000	10,930		
1991	627,325	5.01%	1,343,325	6.66%		716,000	12,181		
1992	193,854	-69.10%	1,432,854	6.66%		1,239,000	12,911		
1993	204,615	5.55%	1,528,350	6.66%		590,000	13,659		
1994	215,973	5.55%	1,630,210	6.66%		1,414,237	14,427		
1995	227,962	5.55%	1,738,859	6.66%		1,510,898	15,237		
1996	240,616	5.55%	1,854,750	6.66%		1,614,134	16,093		
1997	253,972	5.55%	1,978,363	6.66%		1,724,392	16,996	Av. Growth	Av. Growth
1998	268,070	5.55%	2,110,216	6.66%		1,842,146	17,951	Rate	Rate
1999	282,950	5.55%	2,250,856	6.66%		1,967,906	18,896	(1989-00)	(1992-00)
2000	298,657	5.55%	2,400,869	6.66%		2,102,213	19,891	0.0666	0.0555
2001	314,378	5.26%	2,527,249	5.26%		2,212,872	20,938		
2002	330,926	5.26%	2,660,281	5.26%		2,329,355	22,040		
2003	348,346	5.26%	2,800,316	5.26%		2,451,971	23,200		
2004	366,682	5.26%	2,947,723	5.26%		2,581,040	24,421		
2005	385,984	5.26%	3,102,889	5.26%		2,716,904	25,707		
2006	406,302	5.26%	3,266,222	5.26%		2,859,920	27,060		
2007	427,690	5.26%	3,438,153	5.26%		3,010,464	28,484		
2008	450,203	5.26%	3,619,135	5.26%		3,168,932	29,984	Av. grth rate	
2009	473,901	5.26%	3,809,643	5.26%		3,335,742	31,562	(2000-2010)	
2010	498,847	5.26%	4,010,180	5.26%		3,511,333	33,224	0.0526	

C. Import forecast

From A and B, the total deficit (import) in target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	2,102	3,511

The volume to be handled at the study ports will be estimated later.

2) Sugar

The volume of sugar unloaded at the port of Iran shows a tendency to increase from 1988 to 1992 as shown in Table A-3.5.3 - 8 and Figures A-3.5.3 - 15 and - 16. The future values of domestic demand are determined using the data on the future population forecast and per capita consumption.

A. Production Forecast

The domestic production of sugar shows a tendency to increase from 1980 to 1985, but the production during 1985-1989 does not show a clear growth tendency as shown in Figure A-3.5.3-(3)-2)-1. Therefore we have adopted the average value during 1985-1989 as the 1990 and 1991 values. The sugar production value of 1992 is calculated from domestic consumption value and unloaded volume at the port in 1992. The average growth rate of production from 1980 to 1992 has been adopted as the future production in target years.

	2000/01	2010/11
Production (thousand tons)	747	1,091

B. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by population. So, per capita consumption can be expressed as;

$$(P + I) / \text{population}$$

where P: Total production
I: Import volume

Table A-3.5.3 - 8 lists the data for calculating per capita consumption of sugar from 1980 to 1991. As it is fluctuating annually and does not show a clear growth tendency, the maximum value of past data has been made the target year's per capita consumption. From 1991 to 2010, the value of per capita consumption gradually increases.

	2000/01	2010/11
Consumption per capita; (kg/capita)	24.1	30.0

Table A-3.5.3-8 Sugar Forecast

Year	Production (tons)	Import (tons)	Consumption Prod. + Imprt. (tons)	Population (Persons)	Consumption in kg/inhabi. per year	
1976	-			33,709,000		
1977	752,000			34,992,000		
1978	620,000			36,332,000		
1979	450,000			37,731,000		
1980	350,000	800,000	1,150,000	39,192,000	29.3	
1981	400,000			40,718,000		
1982	400,000			42,313,000		
1983	500,000			43,979,000		
1984	600,000			45,721,000		
1985	696,000	598,000	1,294,000	47,385,000	27.3	
1986	600,000	700,000	1,300,000	49,445,000	26.3	
1987	603,000	Avg. Value (1985-89) 490,000	1,093,000	51,073,000	21.4	
1988	725,000	269,000	994,000	52,779,000	18.8	
1989	603,000	645,400	502,000	54,364,000	20.3	
1990	645,000	Avg. Growth Rate (1983-93) 584,000	1,229,000	55,869,000	22.0	
1991	645,000	487,000	1,132,000	57,234,000	19.8	Avg. Value (1985-93)
1992	645,000	633,000	1,278,000	58,574,000	21.8	
1993	645,000	2.58% 344,000	989,000	59,946,000	16.5	21.6
1994	661,635	662,502	1,324,137	61,349,000	21.6	
1995	678,700	676,453	1,355,153	62,786,000	21.6	
1996	696,204	690,676	1,386,881	64,256,000	21.6	
1997	714,160	705,182	1,419,342	65,760,000	21.6	
1998	732,579	720,002	1,452,581	67,300,000	21.6	
1999	751,473	730,160	1,481,633	68,646,000	21.6	
2000	770,855	740,413	1,511,267	70,019,000	21.6	
2001	790,736	750,749	1,541,484	71,419,000	21.6	
2002	811,130	761,198	1,572,328	72,848,000	21.6	
2003	832,050	771,725	1,603,775	74,305,000	21.6	
2004	853,510	782,339	1,635,848	75,791,000	21.6	
2005	875,523	793,047	1,668,569	77,307,000	21.6	
2006	898,103	803,834	1,701,938	78,853,000	21.6	
2007	921,267	Av. Growth Rate (1992-10) 814,708	1,735,975	80,430,000	21.6	
2008	945,027	825,654	1,770,682	82,038,000	21.6	
2009	969,401	836,700	1,806,100	83,679,000	21.6	
2010	994,403	2.58% 847,829	1,842,231	85,353,000	21.6	

Figure A-3.5.3-15 Sugar Production

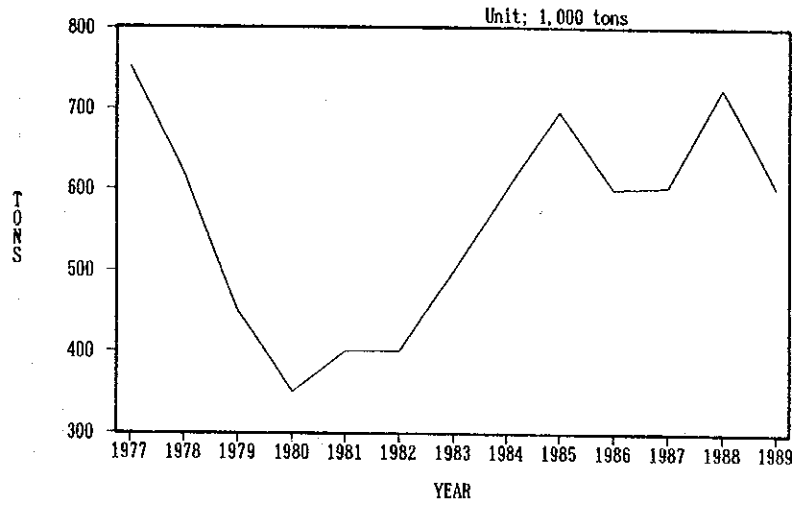


Figure A-3.5.3-16 Import of Sugar

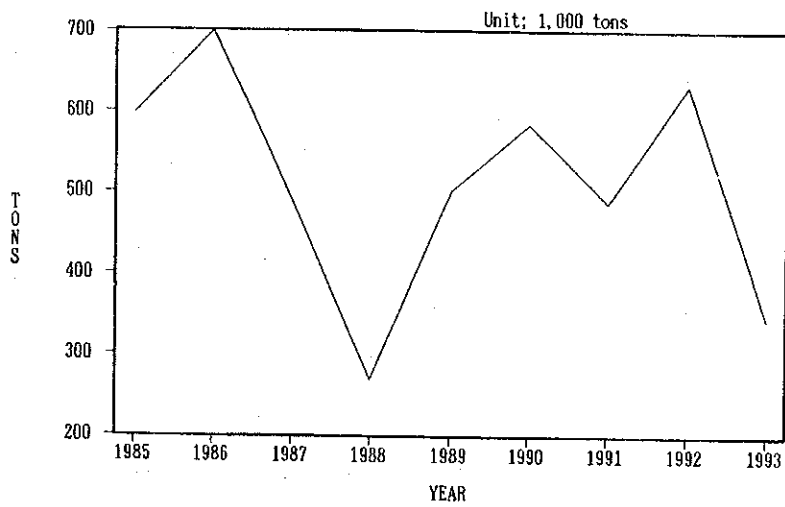


Figure A-3.5.3-12 Fertilizer Production

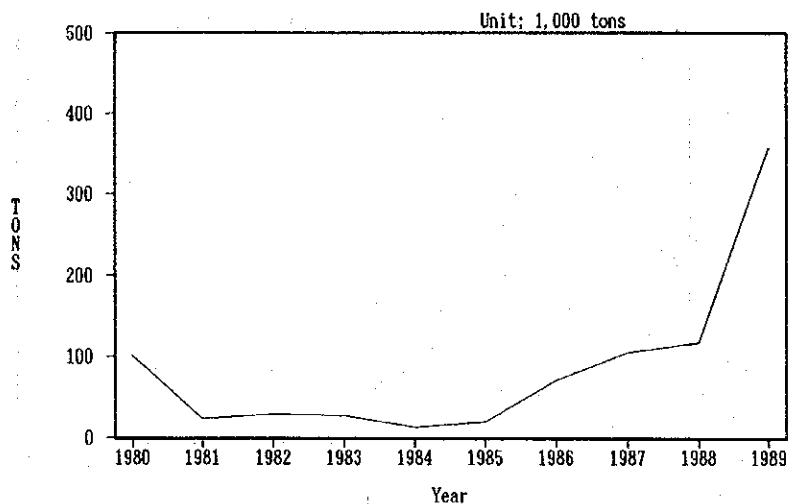


Figure A-3.5.3-13 Fertilizer Consumption

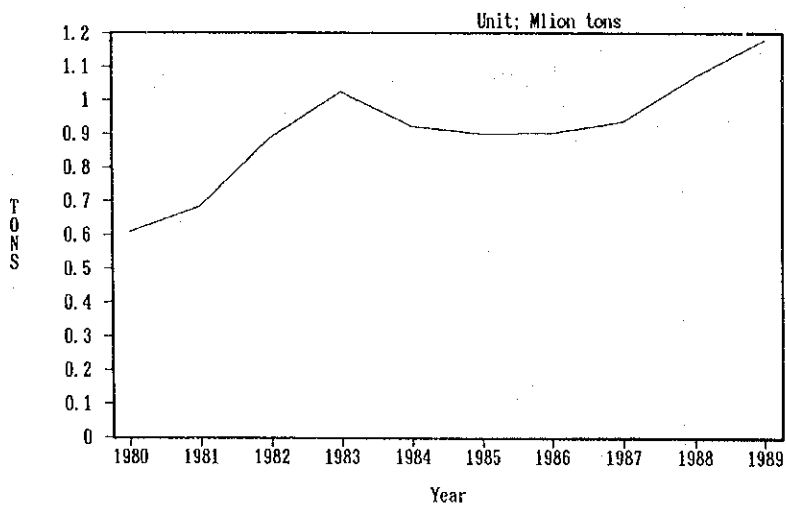
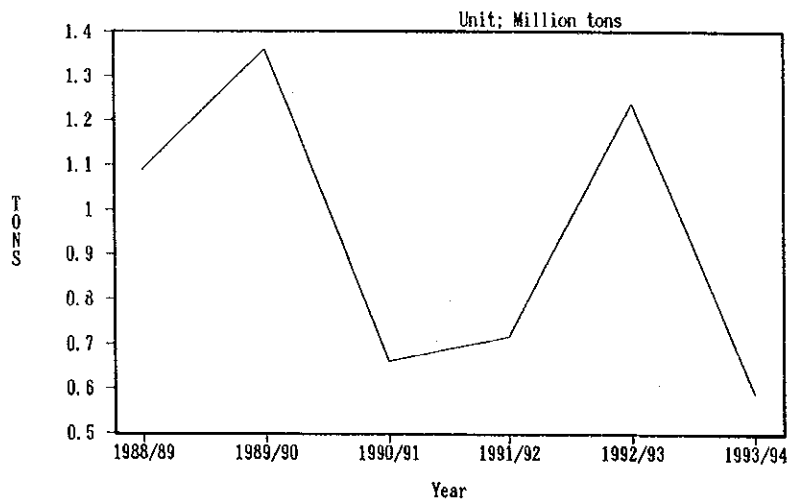


Figure A-3.5.3-14 Import of Fertilizers



C. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1-(1).

	2000/01	2010/11
Total consumption (thousand tons)	1,687	2,561

D. Import forecast

From A and C, the total deficit (import) in target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	940	1,470

The volume to be handled at the study ports will be estimated later.

3) Rice

Table A-3.5.3 - 9 and Figures A-3.5.3 - 17, - 18 and - 19 indicate the cultivated area, yield rate and total production of rice in Iran from 1976 to 1992. Cultivated area is clearly increasing but has fluctuated year by year from 1979 to 1992. The yield rates of the latest four years show a notable increase. Total production is fluctuating year by year from 1976 to 1989, but shows a notable increase from 1988 to 1991 and a tendency to increase. Future production is estimated by multiplying the future cultivated area by the future yield rate, which are predicted from growing rate from 1976-1992 and average value from 1989-1992.

A. Cultivated area forecast

Figure A-3.5.3 - 17 shows the national cultivated area of rice from 1976 to 1992. since 1979 there is a tendency to increase due to the agricultural policy of the Iran government. It is assumed that the cultivated area in the future will increase at the same rate as it has since 1976 and the forecast area for the target years is as shown below.

	2000/01	2010/11
Cultivated area (thousand ha)	760	979

B. Yield rate forecast

As shown in Figure A-3.5.3 - 18, the yield rate of rice is fluctuating year by year, though it tends to increase. Assuming that the yield rate will increase at the same rate as it has since 1976, the estimated yield rate for the target years is;

	2000/01	2010/11
Yield rate (kg/ha)	4,161	4,325

Table A-3.5.3-9 Rice Forecast

Year	Cultivated Area hectares	Production tons	Yield Rate in kg/ha	PSO IMPORT tons	Consumption Prod. + Imprt tons	Population persons	Consumption In kg/inhabi. per year
1976	413,000	1,566,000	3,792			33,709,000	
1977	404,000	1,400,000	3,465			34,992,000	
1978	386,000	1,527,000	3,956			36,332,000	
1979	381,000	1,348,000	3,538	579,000	1,927,000	37,731,000	51.1
1980	462,000	1,311,000	2,838			39,192,000	
1981	459,000	1,624,000	3,538			40,718,000	
1982	483,000	1,605,000	3,323	692,000	2,297,000	42,313,000	54.3
1983	429,000	1,216,000	2,834	707,000	1,923,000	43,979,000	43.7
1984	442,000	1,484,000	3,357	615,000	2,099,000	45,721,000	45.9
1985	475,000	1,772,000	3,731			47,385,000	
1986	471,000	1,784,000	3,788			49,445,000	
1987	527,000	1,803,000	3,421	879,000	2,682,000	51,073,000	52.5
1988	467,000	1,419,000	3,039	253,000	1,672,000	52,779,000	31.7
1989	519,000	1,854,000	3,572	772,000	2,626,000	54,364,000	48.3
1990	524,000	2,250,000	4,294	643,000	2,893,000	55,869,000	51.8
1991	608,000	2,430,000	3,997	498,000	2,928,000	57,234,000	51.2
1992	620,000	2,501,000	4,034	866,000	3,367,000	58,574,000	57.5
1993	635,945	2,575,261	4,050	786,000	3,361,261	59,946,000	56.1
1994	652,299	2,651,728	4,065	661,118	3,312,846	61,349,000	54.0
1995	669,075	2,730,465	4,081	659,979	3,390,444	62,786,000	54.0
1996	686,281	2,811,539	4,097	658,285	3,469,824	64,256,000	54.0
1997	703,930	2,895,022	4,113	656,018	3,551,040	65,760,000	54.0
1998	722,033	2,980,982	4,129	653,218	3,634,200	67,300,000	54.0
1999	740,602	3,069,496	4,145	637,388	3,706,884	68,646,000	54.0
2000	759,648	3,160,637	4,161	620,389	3,781,026	70,019,000	54.0
2001	779,184	3,254,485	4,177	602,141	3,856,626	71,419,000	54.0
2002	799,223	3,351,119	4,193	582,673	3,933,792	72,848,000	54.0
2003	819,776	3,450,623	4,209	561,847	4,012,470	74,305,000	54.0
2004	840,858	3,553,081	4,226	539,633	4,092,714	75,791,000	54.0
2005	862,483	3,658,582	4,242	515,996	4,174,578	77,307,000	54.0
2006	884,664	3,767,215	4,258	490,847	4,258,062	78,853,000	54.0
2007	907,415	3,879,073	4,275	464,147	4,343,220	80,430,000	54.0
2008	930,751	3,994,254	4,291	435,798	4,430,052	82,038,000	54.0
2009	954,687	4,112,854	4,308	405,812	4,518,666	83,679,000	54.0
2010	979,239	4,234,975	4,325	374,087	4,609,062	85,353,000	54.0

Figure A-3.5.3-17
Cultivated Area of Rice Unit: 1,000 ha

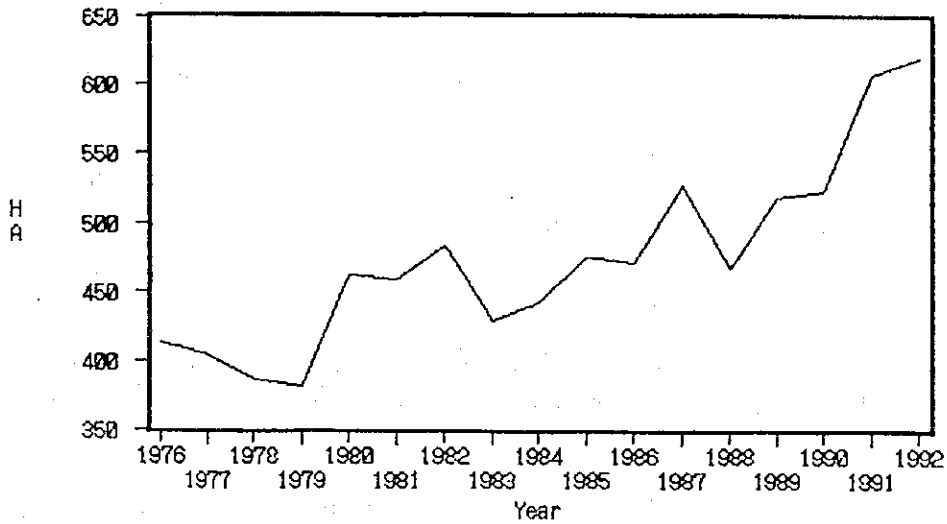


Figure A-3.5.3-18
Yield Rate of Rice Unit: 1,000 kg

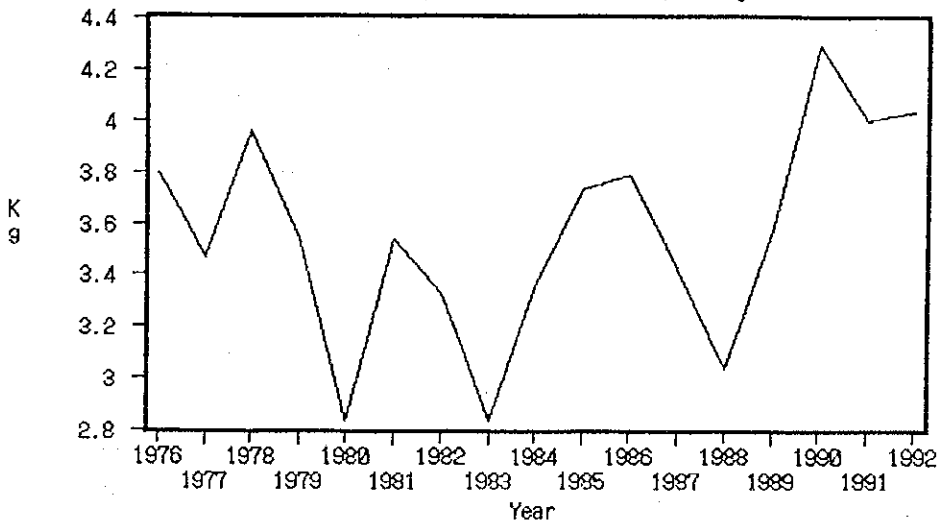
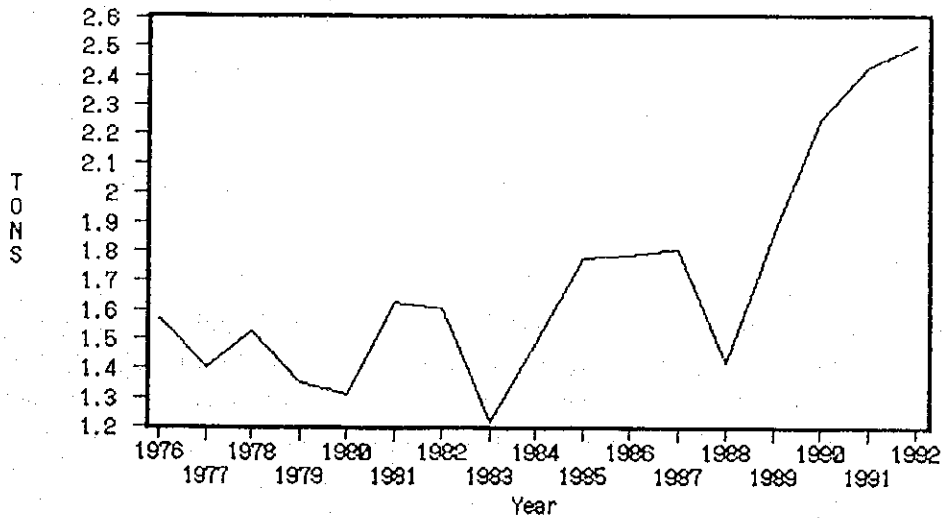


Figure A-3.5.3-19
Production of Rice Unit: Million tons



C. Production forecast

Production of rice in the target years is obtained by multiplying the forecast cultivated area by the yield rate.

	2000/01	2010/11
Production (thousand tons)	3,161	4,235

D. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by total population. So per capita consumption can be expressed as;

$$(P + I) / \text{Population}$$

where P: Total Production
I: Import volume

Table A-3.5.3 - 9 lists the data for calculating per capita consumption of rice from 1976 to 1992. Because it is fluctuating annually and doesn't show a clear growth tendency, we have adopted the average value from 1990 - 1992 as the future per capita consumption.

	2000/2010
Consumption per capita	54 kg/capita

E. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1.

	2000/01	2010/11
Total consumption (thousand tons)	3,781	4,609

F. Import forecast

From C and E, the total deficit(import) in the target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	620	374

The volume to be handled at the study ports will be estimated later.

4) Soy Bean

Table A-3.5.3 - 10 and Figures A-3.5.3 - 20, - 21 and - 22 indicate the cultivated area, yield rate and total production of soy bean in Iran from 1976 to 1992. Cultivated area has clearly increased from 1986 to 1990. The latest three year yield rate shows a low level. Total production is fluctuating year by year from 1976 to 1992. Future

Table A-3.5.3-10 Soy Bean Forecast

Year	Cultivated Area hectares	Production tons	Yield in kg/ha	PSO IMPORT tons	Consumption Prod. + Imprt. tons	Population persons	Consumption In kg/inhabi. per year
1976	59,000	84,000	1,424			33,709,000	
1977	48,000	69,000	1,437			34,992,000	
1978	47,000	70,000	1,489			36,332,000	
1979	46,000	71,000	1,543			37,731,000	
1980	44,000	72,000	1,636			39,192,000	
1981	47,000	62,000	1,319			40,718,000	
1982	55,000	104,000	1,891			42,313,000	
1983	51,000	130,000	2,549			43,979,000	
1984	35,000	67,000	1,914			45,721,000	
1985	37,000	67,000	1,811			47,385,000	
1986	27,000	49,000	1,815			49,445,000	
1987	30,000	58,000	1,933	340,000	398,000	51,073,000	7.8
1988	42,000	69,000	1,643	315,000	384,000	52,779,000	7.3
1989	58,000	83,000	1,431	276,000	359,000	54,364,000	6.6
1990	81,000	100,000	1,235	411,000	511,000	55,869,000	9.1
1991	63,000	80,000	1,270	321,000	401,000	57,234,000	7.0
1992	66,000	100,000	1,515	586,000	686,000	58,574,000	11.7
1993	66,464	108,935	1,639	533,000	641,935	59,946,000	10.7
1994	66,931	109,701	1,639	546,734	656,434	61,349,000	10.7
1995	67,402	110,472	1,639	561,338	671,810	62,786,000	10.7
1996	67,876	111,249	1,639	576,290	687,539	64,256,000	10.7
1997	68,353	112,031	1,639	591,601	703,632	65,760,000	10.7
1998	68,834	112,819	1,639	607,291	720,110	67,300,000	10.7
1999	69,318	113,612	1,639	620,900	734,512	68,646,000	10.7
2000	69,806	114,411	1,639	634,792	749,203	70,019,000	10.7
2001	70,296	115,216	1,639	648,967	764,183	71,419,000	10.7
2002	70,791	116,026	1,639	663,448	779,474	72,848,000	10.7
2003	71,289	116,842	1,639	678,222	795,064	74,305,000	10.7
2004	71,790	117,664	1,639	693,300	810,964	75,791,000	10.7
2005	72,295	118,491	1,639	708,694	827,185	77,307,000	10.7
2006	72,803	119,324	1,639	724,403	843,727	78,853,000	10.7
2007	73,315	120,163	1,639	740,438	860,601	80,430,000	10.7
2008	73,831	121,008	1,639	756,798	877,807	82,038,000	10.7
2009	74,350	121,859	1,639	773,506	895,365	83,679,000	10.7
2010	74,873	122,716	1,639	790,561	913,277	85,353,000	10.7

Figure A-3.5.3-20
Cultivated Area of Soy Bean U: 1,000 ha

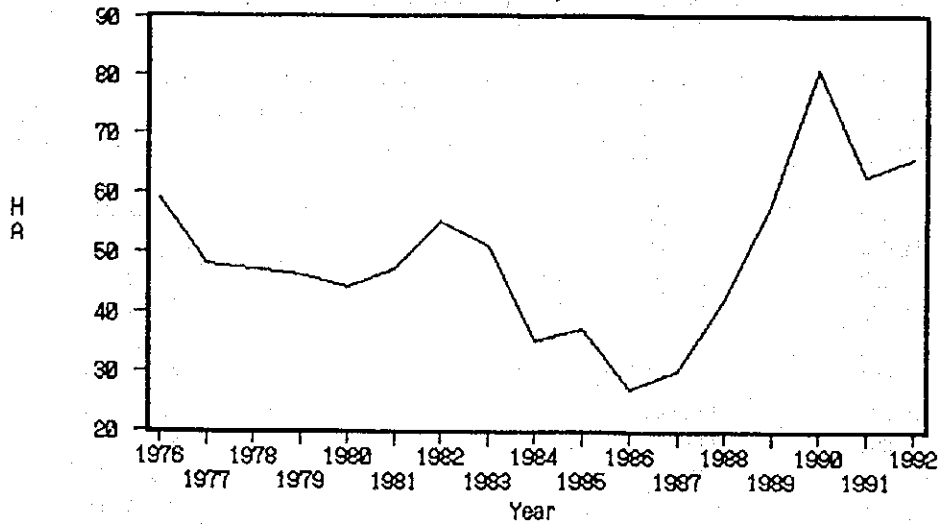


Figure A-3.5.3-21
Yield Rate of Soy Bean Unit: 1,000 Kg

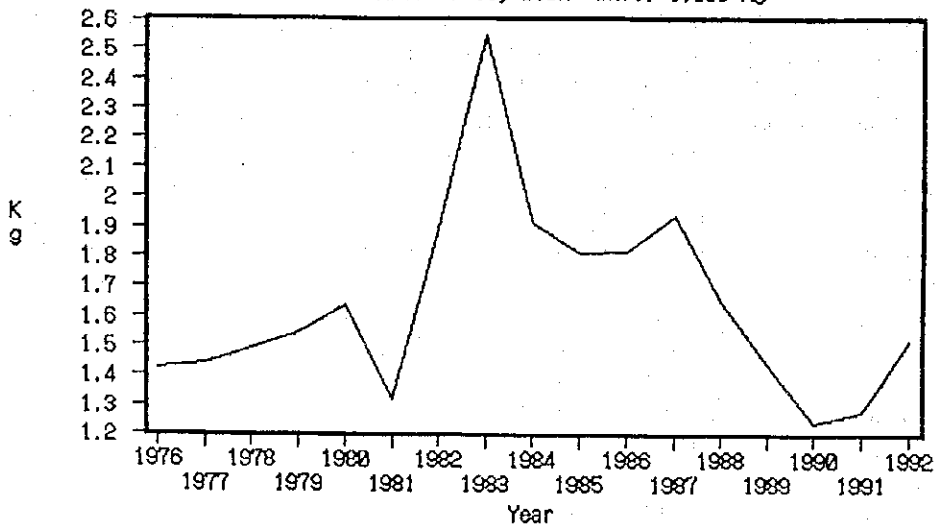
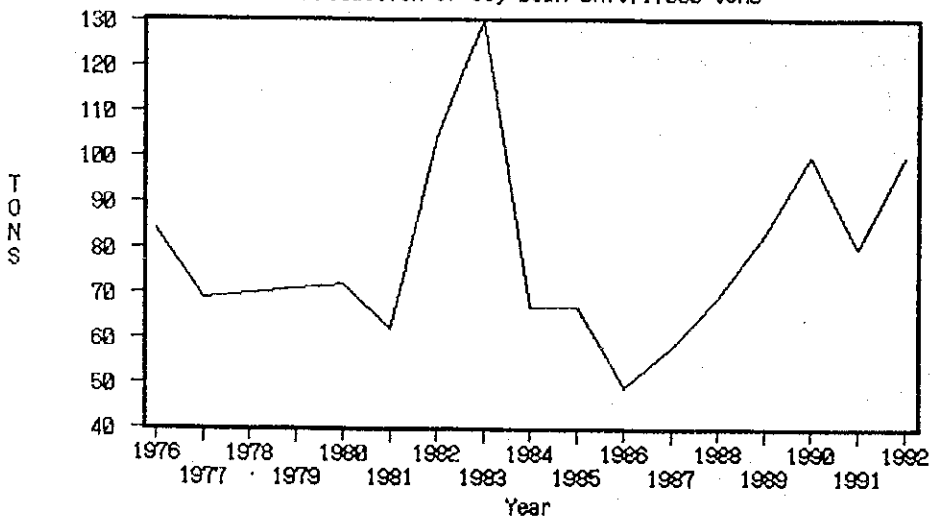


Figure A-3.5.3-22
Production of Soy Bean Unit: 1,000 tons



production is estimated by multiplying the future cultivated area by the future yield rate, which are predicted from average growth rate from 1976-1992 and average value from 1976-1992.

A. Cultivated area forecast

Figure A-3.5.3 - 20 shows the national cultivated area of soy bean from 1976 to 1992. Since 1986 cultivated area has tended to increase due to the agricultural policy of the Iranian government. It is assumed that the cultivated area in the future will increase at the same rate as it has since 1976 and the forecast area for the target years is as shown below.

	2000/01	2010/11
Cultivated area (thousand ha)	70	75

B. Yield rate forecast

As shown in Figure A-3.5.3 - 21, the yield rate of soy bean has been to fluctuating annually. As it is fluctuating annually and does not show a clear growth tendency, the average value from 1976-1992 has been adopted as future yield rate. The estimated yield rate for the target years is;

	2000/01	2010/11
Yield rate (kg/ha)	1,639	1,639

C. Production forecast

Production of soy bean in the target years is obtained by multiplying the forecast cultivated area by the yield rate.

	2000/01	2010/11
Production (thousand tons)	114	123

D. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by total population. So, per capita consumption can be expressed as;

$$(P + I) / \text{Population}$$

where P: Total Production
I: Import volume

Table A-3.5.3 - 10 lists the data for calculating per capita consumption of soy bean from 1987 to 1992. Because it is fluctuating annually and doesn't show a clear growth tendency, we have adopted the value of 1992 as the future per capita consumption.

2000/2010
Consumption per capita 11.7 kg/capita

E. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1 - (1).

	2000/01	2010/11
Total consumption (thousand tons)	819	999

F. Import forecast

From C and E, the total deficit(import) in the target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	705	876

Of the total cereal imports, the volume to be handled at each study port will be estimated later.

(4) Refrigerated Goods

1) Meat

Table A-3.5.3 - 11 and Figures A-3.5.3 - 23, - 24 and - 25 indicate the production, consumption and import volume of meat in Iran from 1980-89, 1987-1992 and 1988-1992, respectively. Production volume of meat has clearly increased from 1988 to 1992. Consumption of meat in Iran shows a tendency to increase from 1988 to 1993. The future values of domestic demand are determined using the data on the future population forecast and per capita consumption.

A. Production forecast

The domestic production of meat shows a clear growth tendency from 1988 to 1992 as shown in Figure A-3.5.3 - 23. Therefore the average growth rate of production from 1988 to 1992 has been referred as the future production in target years.

	2000/01	2010/11
Production (thousand tons)	1,930	3,921

B. Consumption per capita forecast

Total consumption is calculated by multiplying per capita consumption by population. So, per capita consumption can be expressed as;

Table A-3.5.3-11 Meat forecast

Year	Import (1,000 tons)		Production			Consumption (1,000 tons)		Population (1,000 Persons)	Consumption / capita (kg)	
			Red Meat	Chicken	Total					
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987								51,073		
1988	84		525	300	825		909	52,779	17.22	
1989	62	-26.19%	560	330	890		952	54,364	17.51	
1990	27	-56.45%	570	350	920	Grth Rate	947	55,869	16.95	
1991	65	140.74%	595	420	1,015	(1988-92)	1,080	57,234	18.87	Growth Rate
1992	68	4.62%	625	520	1,145	8.54%	1,213	58,574	20.71	(1988-93)
1993	83	22.06%			1,243	8.54%	1,326	59,946	22.12	5.13%
1994	106	27.71%			1,320	6.25%	1,426	61,349	23.25	
1995	131	23.58%			1,404	6.31%	1,535	62,786	24.44	
1996	157	19.85%			1,494	6.45%	1,651	64,256	25.70	
1997	184	17.20%			1,592	6.58%	1,776	65,760	27.01	
1998	212	15.22%			1,699	6.71%	1,911	67,300	28.40	Growth Rate
1999	239	12.74%			1,811	6.54%	2,050	68,646	29.86	(1993-00)
2000	268	12.13%			1,930	6.58%	2,198	70,019	31.39	5.13%
2001	287	7.09%			2,070	7.25%	2,357	71,419	33.00	
2002	308	7.32%			2,219	7.22%	2,527	72,848	34.69	
2003	329	6.82%			2,381	7.29%	2,710	74,305	36.47	
2004	351	6.69%			2,555	7.31%	2,906	75,791	38.34	
2005	373	6.27%			2,743	7.36%	3,116	77,307	40.31	
2006	397	6.43%			2,944	7.34%	3,341	78,853	42.37	
2007	421	6.05%			3,162	7.39%	3,583	80,430	44.55	
2008	445	5.70%			3,397	7.43%	3,842	82,038	46.83	Growth Rate
2009	471	5.84%			3,649	7.41%	4,120	83,679	49.23	(2000-10)
2010	497	5.52%			3,921	7.45%	4,418	85,353	51.76	5.13%

Figure A-3.5.3-23 Production Volume of Meat

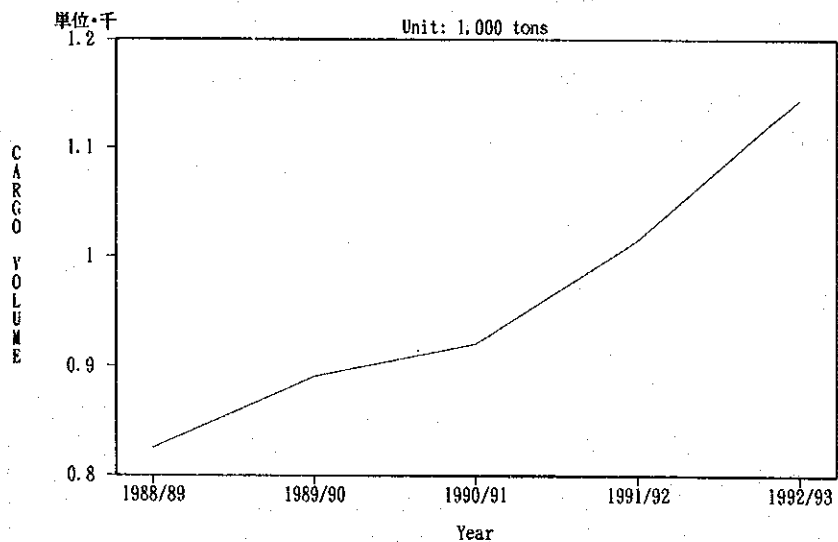


Figure A-3.5.3-24 Consumption Volume of Meat

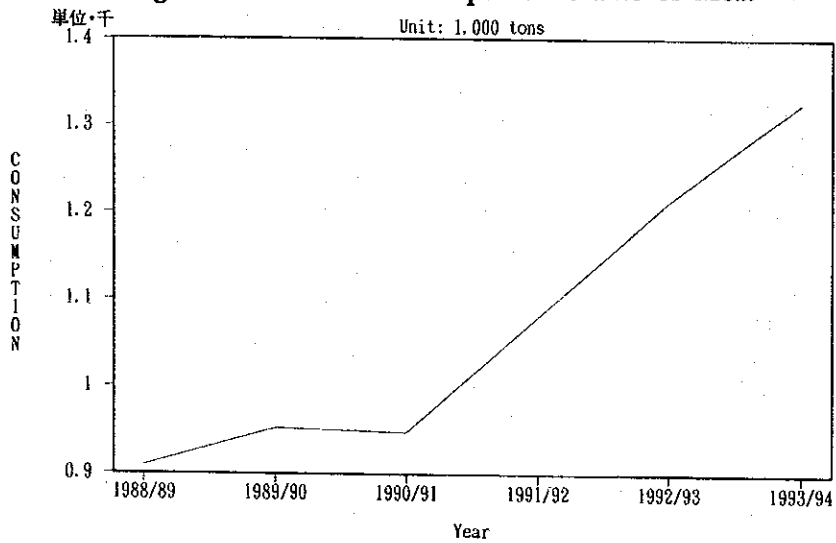
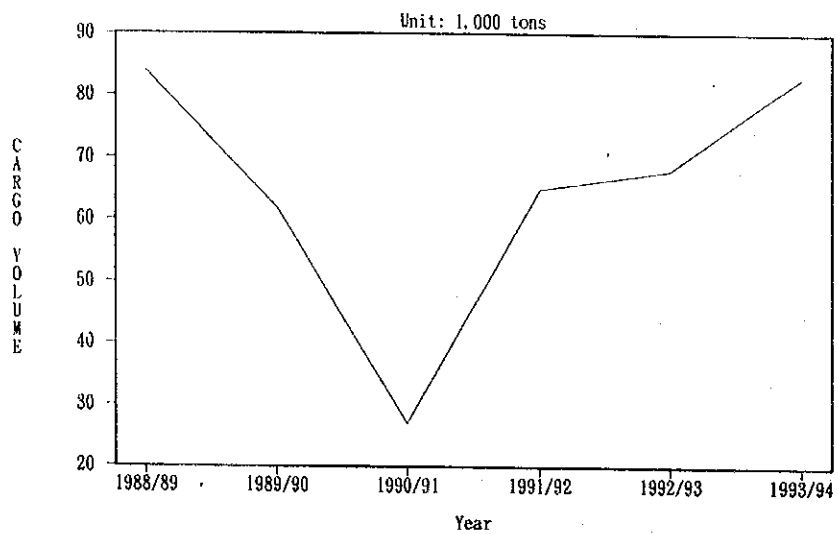


Figure A-3.5.3-25 Import Volume of Meat



$$(P + I) / \text{population}$$

where

P: Total production

I: Import volume

Table A-3.5.3 - 11 lists the data for calculating per capita consumption of meat from 1988 to 1993. The data before 1988 was not available but since then there has been a clear tendency to increase. It is assumed that the per capita consumption in the future will maintain the same average growth rate of 1988 - 1993 in future.

	2000/01	2010/11
Consumption per capita; (kg/capita)	31.39	51.76

C. Total consumption forecast

Total consumption can be calculated from the per capita consumption and the estimated population mentioned in chapter 3.2.1 - (1).

	2000/01	2010/11
Total consumption (thousand tons)	2,198	4,418

D. Import forecast

From A and C, the total deficit (import) in target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	268	497

The volume to be handled at the study ports will be estimated later.

(5) Steel Material

1) Metallic product

The volume of metallic product unloaded at the port of Iran shows a increase from 1989/90 to 1991/92, but in 1992/93 decreases dramatically sudden as shown in Table A-3.5.3 -12 and Figure A-3.5.3 - 26. As the data and information to determine the future trade of metallic product are lacking, in this report, the future values of domestic demand are determined using the corresponding GDP's value of the target year.

A. Production Forecast

The domestic production of metallic product shows a clear tendency to increase from 1986/87 to 1992/93 as shown in Figure A-3.5.3 - 27. Therefore production of metallic product in 1990 and 1992 is calculated using the average growth rate from 1989/90 to 1992/93 of GDP. The metallic production value from 1993/94 to 2000/01 and from

Table A-3.5.3-12 Metallic Product forecast

Year	Pig Iron (tons)	Crude Steel (tons)	Aluminium Product (tons)	Total Production (tons)		Import (tons)	Consumption (tons)		GDP (bilion IRL)	
1976										
1977										
1978										
1979										
1980	1,396,000	565,000	16,000	1,977,000						
1981			12,500							
1982			45,000							
1983			39,200							
1984			42,000							
1985			43,000			1,608,000	1,608,000			
1986	1,100,000	741,000	37,400	1,878,400			1,878,400	16.82%		
1987	1,226,000	783,000	33,600	2,042,600	8.74%		2,042,600	8.74%	10,368	
1988	1,262,000	883,000	38,200	2,183,200	6.88%	624,000	2,807,200	37.43%	9,468	
1989	1,000,000	939,350	40,000	1,979,350	-9.34%	845,000	2,824,350	0.61%	9,782	Av. Growth
1990				2,171,201	9.69%	3,861,000	6,032,201	113.58%	10,930	Rate
1991				2,381,647	9.69%	5,026,000	7,407,647	22.80%	12,181	(1989-92)
1992				2,612,491	9.69%	3,067,000	5,679,491	-23.33%	12,911	9.69%
1993				2,757,509	5.55%	3,057,000	5,814,509	2.38%	13,659	
1994				2,910,576	5.55%	3,226,692	6,137,269	5.55%	14,427	
1995				3,072,141	5.55%	3,405,804	6,477,944	5.55%	15,237	
1996				3,242,673	5.55%	3,594,858	6,837,531	5.55%	16,093	
1997				3,422,672	5.55%	3,794,406	7,217,078	5.55%	16,996	Av. Growth
1998				3,612,662	5.55%	4,005,031	7,617,693	5.55%	17,951	Rate
1999				3,813,199	5.55%	4,227,348	8,040,547	5.55%	18,896	(1991-00)
2000				4,024,867	5.55%	4,462,005	8,486,873	5.55%	19,891	5.55%
2001				4,236,733	5.26%	4,696,882	8,933,614	5.26%	20,938	
2002				4,459,751	5.26%	4,944,122	9,403,873	5.26%	22,040	
2003				4,694,509	5.26%	5,204,376	9,898,885	5.26%	23,200	
2004				4,941,624	5.26%	5,478,330	10,419,954	5.26%	24,421	
2005				5,201,747	5.26%	5,766,705	10,968,452	5.26%	25,707	
2006				5,475,562	5.26%	6,070,260	11,545,822	5.26%	27,060	
2007				5,763,792	5.26%	6,389,793	12,153,585	5.26%	28,484	Av. Growth
2008				6,067,193	5.26%	6,726,147	12,793,339	5.26%	29,984	Rate
2009				6,386,565	5.26%	7,080,205	13,466,770	5.26%	31,562	(2000-10)
2010				6,722,748	5.26%	7,452,902	14,175,650	5.26%	33,224	5.26%

Figure A-3.5.3-26 Metallic Import

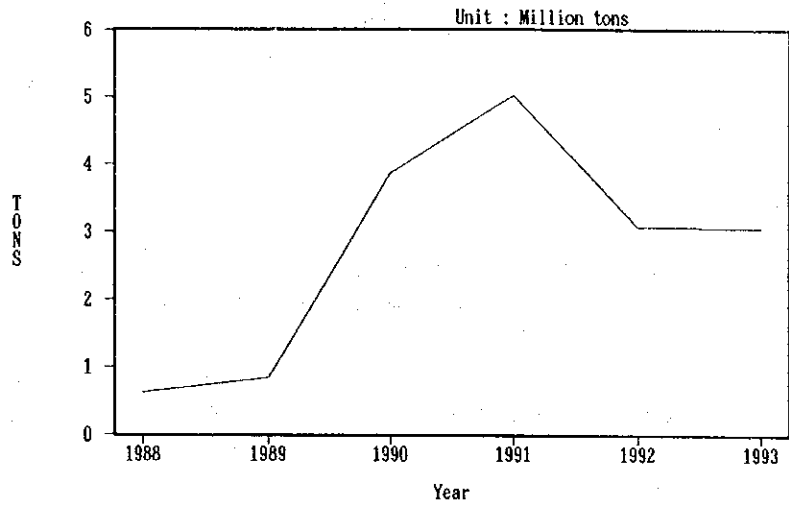
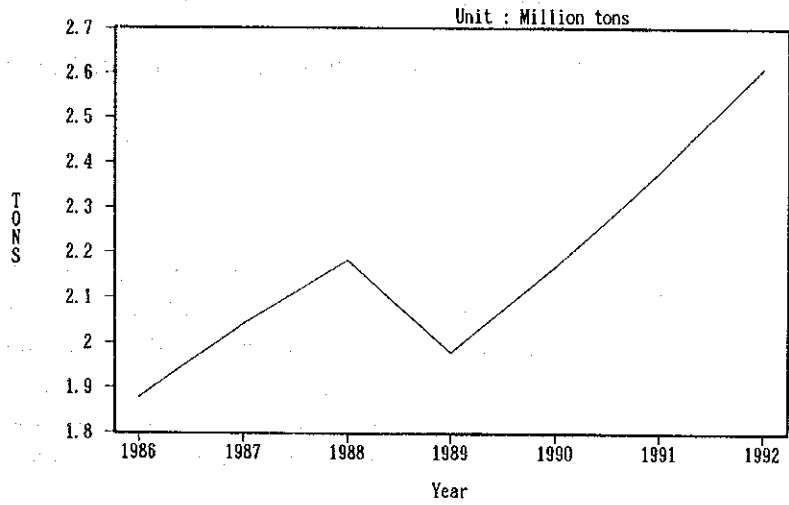


Figure A-3.5.3-27 Metallic Production



2001/02 to 2010 is calculated using the average growth rate from 1992/93 to 2000/01 and from 2000/01 to 2010/11 respectively.

	2000/01	2010/11
Production (thousand tons)	4,025	6,723

B. Total consumption forecast

Total consumption can be estimated by the corresponding growth rate of GDP and the estimated value of GDP mentioned in chapter 3.2.1-(3).

	2000/01	2010/11
Total consumption (thousand tons)	8,487	14,176

C. Import forecast

From A and B, the total deficit (import) in target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	4,462	7,453

The volume to be handled at the study ports will be estimated later.

(6) Mineral

1) Coal

The volume of coal unloaded at the port of Iran shows a tendency to increase from 1988/89 to 1993/94 as shown in Table A-3.5.3 - 13 and Figure A-3.5.3 - 28. As the data and information to determine the future trade of coal are lacking, in this report, Import volume of coal will be forecasted on the assumption that the ratio of coal in the import commercial energy trade will remain constant in the future. The future trade values of commercial energy are determined using the expected growth rate of the energy sector.

A. Trade Forecast of Commercial Energy

The total trade volume of commercial energy will be forecasted on the assumption that growth rate of total trade volume will increase at the same pace as the growth rate of energy sector in the future and ratio of import/export will maintain its 1989ratio. (see Table A-3.5.3 - 13)

		2000/01	2010/11
Trade volume (thousand tons)	Import	23,768	44,756
	Export	315,781	594,618

Table A-3.5.3-13 Coal Forecast

Year	Production		Import		Consumption		GDP (Billion IRL)	Trade of Commercial Energy					
	1000 tons	Growth Rate	1000 tons	Growth Rate	1000 tons	Growth Rate		Imports		Exports		Total	
								1,000 tons	Ratio	1,000 tons	Ratio	1,000 tons	Growth Rate
1980	900							237	0.4%	62,376	99.6%	62,613	
1981													
1982													
1983													
1984	900												
1985													
1986													
1987	1,240						10,368	7,934	6.1%	123,163	93.9%	131,097	
1988	1,260		140		1,400		9,468	9,597	7.3%	122,003	92.7%	131,600	
1989	1,200		280	100.00%	1,480	5.71%	9,782	11,246	6.8%	153,470	93.2%	164,716	12.09%
1990	1,282	6.80%	551	96.79%	1,833	23.82%	10,930	12,314	7.0%	163,599	93.0%	175,912	6.20%
1991	1,369	6.80%	618	12.16%	1,987	8.41%	12,181	13,151	7.0%	174,719	93.0%	187,870	6.80%
1992	1,462	6.80%	587	-5.02%	2,049	3.12%	12,911	14,045	7.0%	186,595	93.0%	200,640	6.80%
1993	1,561	6.80%	830	41.40%	2,391	16.71%	13,659	14,999	7.0%	199,279	93.0%	214,279	6.80%
1994	1,667	6.80%	856	3.11%	2,523	5.52%	14,427	16,019	7.0%	212,825	93.0%	228,844	6.80%
1995	1,781	6.80%	882	3.02%	2,662	5.52%	15,237	17,108	7.0%	227,291	93.0%	244,399	6.80%
1996	1,902	6.80%	907	2.93%	2,809	5.52%	16,093	18,271	7.0%	242,741	93.0%	261,012	6.80%
1997	2,031	6.80%	933	2.83%	2,964	5.52%	16,996	19,513	7.0%	259,241	93.0%	278,754	6.80%
1998	2,169	6.80%	959	2.73%	3,127	5.52%	17,951	20,839	7.0%	276,863	93.0%	297,702	6.80%
1999	2,316	6.80%	984	2.62%	3,300	5.52%	18,896	22,256	7.0%	295,683	93.0%	317,938	6.80%
2000	2,474	6.80%	1,008	2.50%	3,482	5.52%	19,891	23,768	7.0%	315,781	93.0%	339,550	6.80%
2001	2,635	6.53%	1,030	2.15%	3,665	5.26%	20,938	25,321	7.0%	336,412	93.0%	361,734	6.53%
2002	2,807	6.53%	1,051	2.02%	3,858	5.26%	22,040	26,976	7.0%	358,391	93.0%	385,366	6.53%
2003	2,991	6.53%	1,070	1.87%	4,061	5.26%	23,200	28,738	7.0%	381,805	93.0%	410,543	6.53%
2004	3,186	6.53%	1,089	1.72%	4,275	5.26%	24,421	30,616	7.0%	406,750	93.0%	437,365	6.53%
2005	3,394	6.53%	1,106	1.55%	4,500	5.26%	25,707	32,616	7.0%	433,324	93.0%	465,939	6.53%
2006	3,616	6.53%	1,121	1.37%	4,737	5.26%	27,060	34,747	7.0%	461,634	93.0%	496,380	6.53%
2007	3,853	6.53%	1,134	1.17%	4,986	5.26%	28,484	37,017	7.0%	491,793	93.0%	528,810	6.53%
2008	4,104	6.53%	1,145	0.95%	5,249	5.26%	29,984	39,435	7.0%	523,923	93.0%	563,359	6.53%
2009	4,372	6.53%	1,153	0.71%	5,525	5.26%	31,562	42,011	7.0%	558,153	93.0%	600,164	6.53%
2010	4,658	6.53%	1,158	0.45%	5,816	5.26%	33,224	44,756	7.0%	594,618	93.0%	639,374	6.53%

Source: PSO & Statistical Yearbook

Unit: Thousand metric tons of coal equivalent

Figure A-3.5.3-18 Coal Import

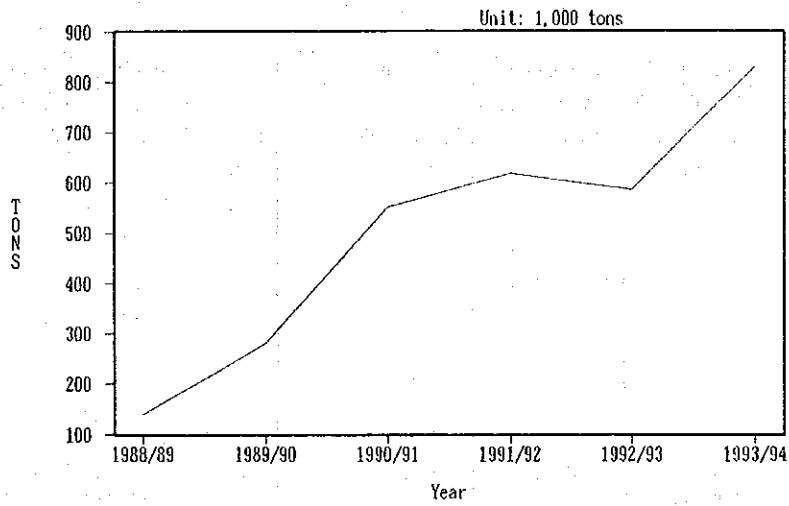
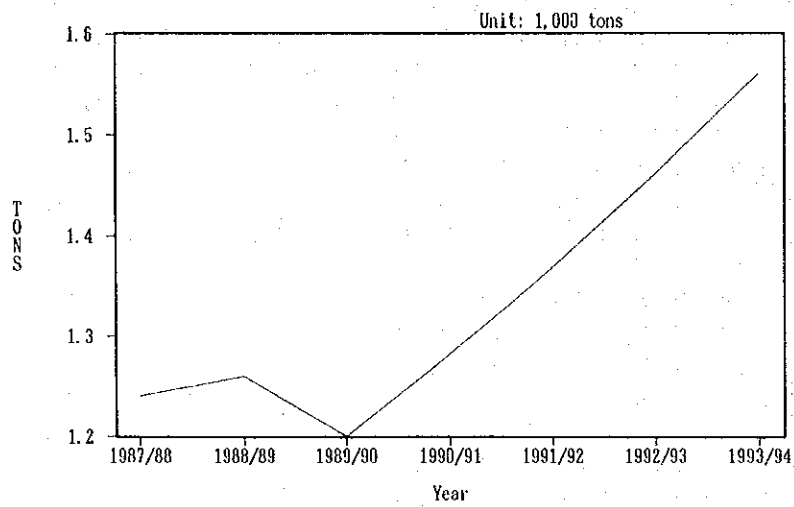


Figure A-3.5.3-29 Coal Production



B. Production Forecast

The domestic production of coal shows a clear tendency to increase from 1987/88 to 1993/94 as shown in Figure A-3.5.3 - 27. Therefore, the coal production value from 1994/95 to 2000/01 and 2010/11 is calculated using the same growth rate from 1994/95 to 2010/11 of total commercial energy.

	2000/01	2010/11
Production (thousand tons)	2,474	4,658

C. Total consumption forecast

Total consumption volume from 1994/95 to 2000/01 and from 2001/02 to 2010/11 will be calculated by using each average growth rate of GDP from 1993/94 to 2000/01 and from 2001/02 to 2010/11, respectively mentioned in chapter 3.2.1-(3).

	2000/01	2010/11
Total consumption (thousand tons)	3,482	5,816

C. Import forecast

From B and C, the total deficit (import) in target years is shown below.

	2000/01	2010/11
Import volume (thousand tons)	1,008	1,158

The volume to be handled at the study ports will be estimated later.

(7) General Cargo

In this study, general cargoes mean those that are combined with container cargo and other cargo except those already mentioned in the preceding chapter. Among all the commodities handled at the seven ports, the general cargo is the largest in terms of volume as shown in Table A-3.5.3-1. Both container and general cargo volume will increase in line with the Iranian economy.

1) Container cargo

As shown in Figure A-3.5.3-29, the import volume of container cargo has clearly increased from 1988/89 to 1990/91, but from 1990/91 to 1993/94 it shows a slight tendency to decrease.

However, from the viewpoint of container trade in the world, future container cargo volume in Iran will inevitably increase; in fact, it must increase in order to develop the country.

A. Trend of containerization at the study ports

Percentage of containerization by unload/load is shown in Table A-3.5.3 - 14. The percentage of containerization is the ratio of the volume of container cargoes to the volume of containerizable cargoes. The volume of containerizable cargo was estimated by their suitability for containerization from the statistic data and o/d survey. The greater part of categories of goods are suitable for containerization, but most steel & metal and fertilizer have been pronounced unsuitable for containerization. After a careful check of world trends, containerization ratio of total(import & export) cargo in Iranian ports is decided as 53% in the target year 2010/11.

B. Estimation of volume of container cargoes in target years

The percentage of containerization in target years is estimated by using the logistic curves in Figure A-3.5.3 - 30. Then, the volume of container cargoes in target years can be obtained by multiplying the volume of cargo suitable for containerization by these percentages. Table 3.5.3 - 14 shows the estimated volume of container cargoes at the study ports obtained by application of the logistic curve (see Fig. 3.5.3 - 30). Containerization ratio from 1994/95 to 2010/11 will be calculated using the average growth rate from 1993/94 to 2010/11. Based on the aforesaid manner, containerization ratio in 2000/01 and 2010/11 year will reach 18.4% and 53.0% respectively.

Container handling volume in each target year is calculated as follows:

$$V = C \times \frac{G_c}{(1 - C)}$$

V : Container handling volume (tons/year)

C : Containerization ratio (%)

G_c : General cargo volume(tons)

The volume is estimated by the following method described in next chapter 3.5.3-(7)-2).

	2000/01	2010/11
Container Handling Volume (thousand tons)	2,157	18,461

C. Import/Export Volume of Container Cargo

The share of import and export container cargo in the target year 2010/11 is decided as 50% respectively and the share of import and export container cargo ratio from 1994/95 - 2010/11 is calculated using the average growth rate from 1993/94 to 2010/11.

Table A-3.5.3-14

ANNUAL TRAFFIC OF CONTAINERIZED CARGO

Year	CONTAINER		CONTAINER		CONTAINER		CONTAINER		CONTAINER		Ratio	Growth Rate	GENERAL CARGO	
	Total	Ratio %	Import	Export	Cont. Ratio	Cont. Ratio	Cont. Ratio	Growth Rate	Import	Export			Import %	Export %
1976	617													
1977	391													
1978	357													
1979	138													
1980	51													
1981	258													
1982	238													
1983	195													
1984	184													
1985	231													
1986	153	6.3%	101	52	65.3%	6.8%	5.4%	5.4%	1.485	66.8%	598	39.2%	2,290	16.7%
1987	296	7.2%	224	72	75.5%	7.2%	7.3%	6.7%	3.088	75.5%	1,002	24.5%	3,794	65.7%
1988	606	13.9%	616	80	88.0%	15.8%	7.3%	4.994	3,908	78.0%	1,086	21.7%	4,298	13.3%
1989	675	10.1%	546	127	81.1%	11.9%	6.2%	6.628	4,594	69.3%	2,034	30.7%	5,955	38.6%
1990	704	14.1%	657	47	93.3%	15.8%	5.7%	4.999	4,168	83.1%	831	16.6%	4,295	27.9%
1991	647	8.0%	561	87	86.6%	12.0%	6.2%	6.049	4,676	77.3%	1,373	22.7%	5,402	25.8%
1992	764	14.5%	661	103	86.5%	15.5%	10.1%	5,272	4,252	80.7%	1,020	19.3%	4,508	16.5%
1993	902	15.0%	780	122	86.4%	16.0%	9.7%	6,153	4,887	79.4%	1,266	20.6%	5,251	15.4%
1994	1,066	18.2%	919	147	86.2%	16.5%	9.4%	7,126	5,572	78.2%	1,554	21.8%	6,060	14.2%
1995	1,265	15.5%	1,084	181	85.7%	17.2%	9.6%	8,187	6,298	76.9%	1,889	23.1%	6,922	13.4%
1996	1,504	16.1%	1,278	226	85.0%	18.1%	9.9%	9,355	7,077	75.8%	2,278	24.4%	7,851	13.4%
1997	1,798	17.2%	1,507	291	83.8%	19.3%	10.9%	10,470	7,804	74.5%	2,666	25.5%	8,672	10.5%
1998	2,157	18.4%	1,777	380	82.4%	20.7%	12.2%	11,700	8,587	73.4%	3,113	26.5%	9,543	10.0%
1999	2,598	19.8%	2,095	503	80.6%	22.1%	13.8%	13,121	9,485	72.3%	3,636	27.7%	10,523	10.3%
2000	3,141	21.4%	2,470	671	78.6%	23.6%	15.8%	14,689	10,452	71.2%	4,237	28.8%	11,548	9.7%
2001	3,815	23.2%	2,913	902	76.4%	25.3%	18.3%	16,417	11,491	70.0%	4,926	30.0%	12,602	9.1%
2002	4,658	25.4%	3,435	1,223	73.7%	27.3%	21.2%	18,323	12,559	68.5%	5,764	31.5%	13,665	8.4%
2003	5,723	28.0%	4,050	1,673	70.8%	29.3%	25.3%	20,427	13,810	67.6%	6,617	32.4%	14,704	7.6%
2004	7,080	31.1%	4,775	2,305	67.4%	31.6%	30.1%	22,752	15,101	66.4%	7,651	33.6%	15,972	6.0%
2005	8,834	34.9%	5,631	3,203	63.7%	34.1%	36.3%	25,325	16,492	65.1%	8,833	34.9%	16,491	5.2%
2006	11,137	39.5%	6,639	4,498	59.6%	36.9%	44.2%	28,169	17,984	63.8%	10,185	36.2%	17,102	3.3%
2007	14,221	45.4%	7,828	6,393	55.0%	40.0%	54.5%	31,323	19,594	62.5%	11,729	37.4%	17,102	0.4%
2008	18,461	53.0%	9,230	9,230	50.0%	43.3%	58.4%	34,816	21,324	61.2%	13,493	38.8%	16,355	-4.1%
2009														
2010														

Figure A-3.5.3-30 Container Cargo

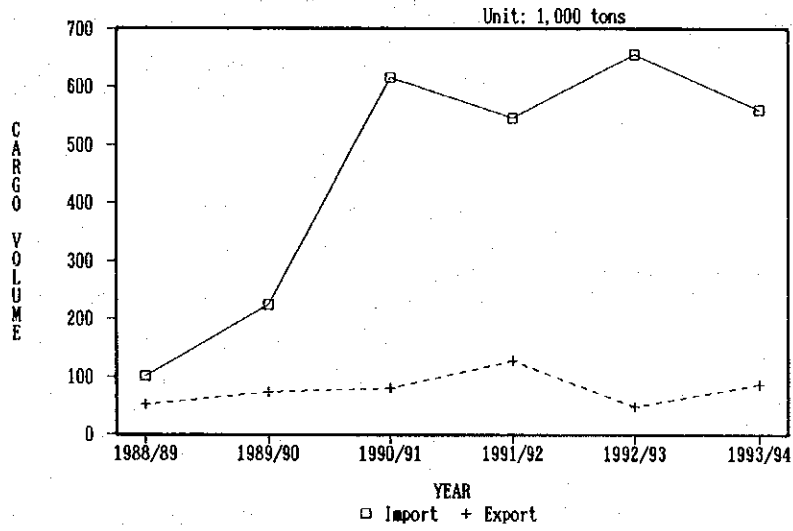
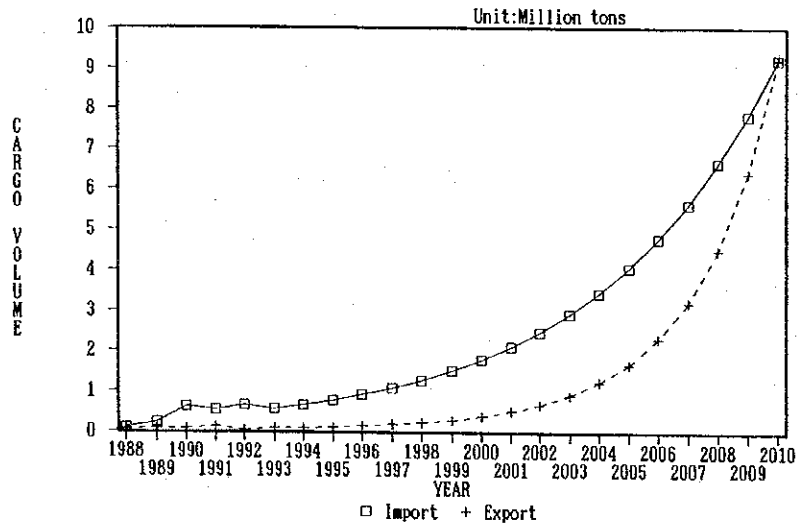


Figure A-3.5.3-31 Logistic Curve



	2000/01	2010/11
Share of Import	82.4%	50.0%
Import Volume (thousand tons)	1,777	9,231
Share of Export	17.6%	50.0%
Export Volume (thousand tons)	380	9,231

D. Number of container handled at study ports

The average weight of container cargo is set as 11.5 tons/TEU based on average of last 3 years. Ratio of empty container is set as 5% based on the actual data. Using the cargo weight and the export volume above, the future container handling volume is as shown below.

	2000/01	2010/11
Number of container(thousand TEU)	188	1,605

2) Others

As shown in Figure A-3.5.3 - 31, the import and export volume of general cargo has clearly increased from 1988/89 to 1993/94. As mentioned already in chapter 3.5.2-(2), general cargo can be considered to be closely related with economic indexes such as GDP. The correlation between general cargo and GDP for 1988/89 through 1993/94 can be expressed by the following equation.

V : Total General Cargo Volume

$$V = 1.314527 \times \text{GDP} - 9741.899 \quad (r^2=0.94832)$$

A. Forecast of general cargo volume

When GDP(case-2) in target years mentioned in chapter 3.2.1-(3) is inserted into this equation, the forecast of general cargo volume to be handled at the ports is given as;

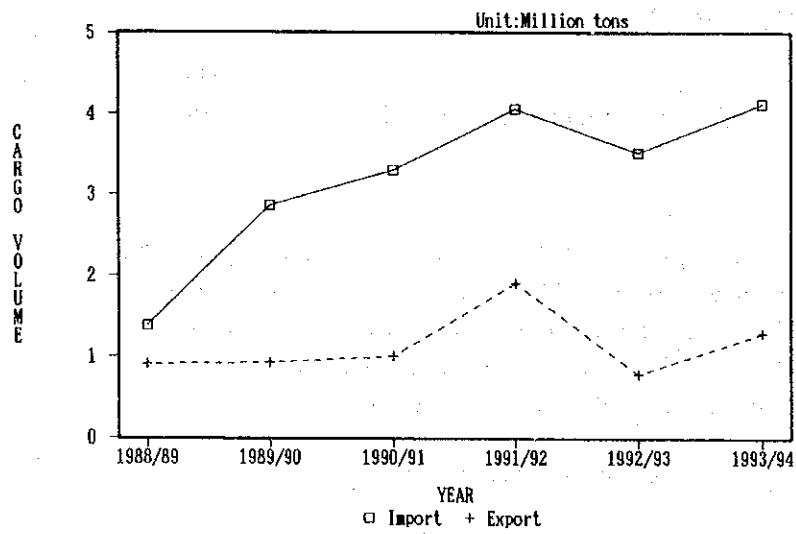
	2000/01	2010/11
Total General Cargo Volume (thousand tons)	9,543	16,355

B. Import/Export Volume of General Cargo

The share of import and export general cargo in the target year 2010/11 decided as 73.9% and 26.1% respectively and the share of import and export container cargo ratio from 1992-2010 is calculated using the average growth rate from 1992 to 2010.

	2000/01	2010/11
Share of Import	71.4%	73.9%
Import Volume (thousand tons)	6,810	12,093
Share of Export	28.6%	26.1%
Export Volume (thousand tons)	2,733	4,262

Figure A-3.5.3-32 General Cargo



2. Export commodities

(1) Dry Bulk

- 1) Sulphur
- 2) Construction materials
- 3) Salt

(2) Liquid Bulk

- 1) Petroleum Product
- 2) Molasses
- 3) Liquid Gas

(3) Bag Cargo

- 1) Chemical Material

(4) Steel Material

- 1) Metallic Product

(5) Mineral

- 1) Copper

(6) General Cargo

- 1) Dried fruits & nuts
- 2) Container Cargo
- 3) Others

Appendix 3.5.3 Micro Forecast

2. Export commodities

(1) Dry Bulk

1) Sulphur

Sulphur loaded from 1988/89 to 1991/92 at the port of Iran shows a stable tendency as shown in Table A-3.5.3 - 15 and Figure A-3.5.3 - 33.

As the data and information to determine the future trade of sulphur is lacking, in this report, sulphur as one of the export goods in Iran will be forecasted on the assumption that the level of exports will remain constant in the future.

Future cargo volume from 1994/95 - 2010/11 is calculated using the average value from 1988/89 - 1991/92.

	2000/01	2010/11
Export volume (thousand tons)	300	300

2) Construction Material

The volume of construction materials loaded at the port of Iran is as shown in Table A-3.5.3 - 15. As the data and information to determine the future trade of construction materials are lacking, in this report, export volume of construction materials is forecasted by its relation with annual growth rate of GDP. Average growth rate of GDP from 1993/94 - 2010/11 is 5.5%; by multiplying this rate from 1993 - 2010 by the export

**Table A-3.5.3 - 15 The handling loaded volume of each commodity
at the seven ports.**

Export

Unit: 1,000 tons

COMMODITY	1988/89		1989/90		1990/91		1991/92		1992/93		1993/94	
	tons	ratio	tons	ratio	tons	ratio	tons	ratio	tons	ratio	tons	ratio
DRY BULK	291	23.3%	325	24.5%	257	19.1%	345	14.5%	119	3.9%	173	3.8%
Sulphur	291	23.3%	325	24.5%	257	19.1%	345	14.5%	0	0.0%	4	0.1%
Const. Material	0	0.0%	0	0.0%	0	0.0%	0	0.0%	79	2.6%	164	3.6%
Salt	0	0.0%	0	0.0%	0	0.0%	0	0.0%	40	1.3%	5	0.1%
LIQUID BULK	0	0.0%	0	0.0%	0	0.0%	0	0.0%	309	10.0%	69	1.5%
Molasses	0	0.0%	0	0.0%	0	0.0%	0	0.0%	43	1.4%	69	1.5%
Petroleum Products	0	0.0%	0	0.0%	0	0.0%	0	0.0%	197	6.4%	0	0.0%
Liquid Gas	0	0.0%	0	0.0%	0	0.0%	0	0.0%	69	2.2%	0	0.0%
BAGGED CARGO	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1,000	32.4%	1,357	30.2%
Chemical Material	0	0.0%	0	0.0%	0	0.0%	0	0.0%	997	32.3%	1,357	30.2%
Rice	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	0.1%	0	0.0%
CONTAINER												
Others	51	4.1%	72	5.4%	79	5.9%	126	5.3%	47	1.5%	86	1.9%
REFRIGERATED GOODS												
Meat	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
STEEL MATERIAL												
Iron Product	0	0.0%	0	0.0%	0	0.0%	0	0.0%	796	25.8%	1,519	33.8%
MINERAL												
Copper	0	0.0%	0	0.0%	0	0.0%	0	0.0%	27	0.9%	7	0.2%
GENERAL CARGO	907	72.6%	930	70.1%	1,007	75.0%	1,908	80.2%	784	25.4%	1,287	28.6%
Dried Fruits & Nuts	124	9.9%	155	11.7%	207	15.4%	35	1.5%	190	6.2%	207	4.6%
Others	783	62.7%	775	58.4%	800	59.6%	1,873	78.7%	594	19.3%	1,080	24.0%
T O T A L	1,249	100%	1,327	100%	1,343	100%	2,379	100%	3,082	100%	4,498	100%

Source: Ports & Shipping Organization

Figure A-3.5.3-33 Export Sulphur

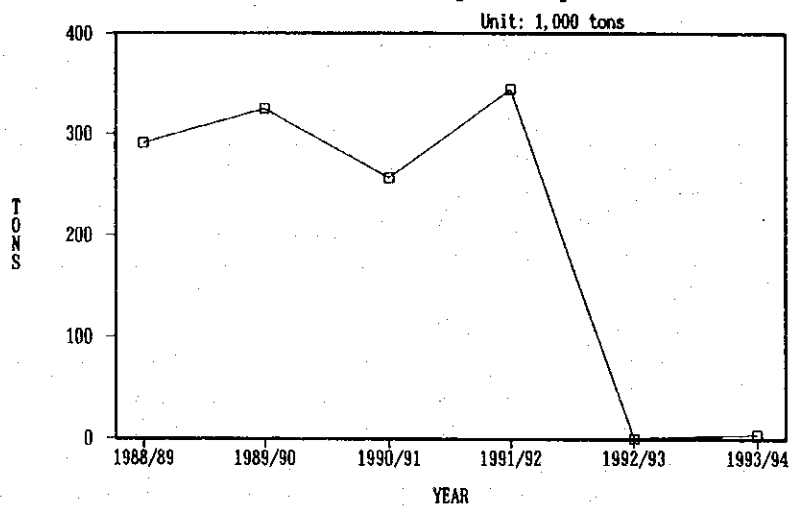
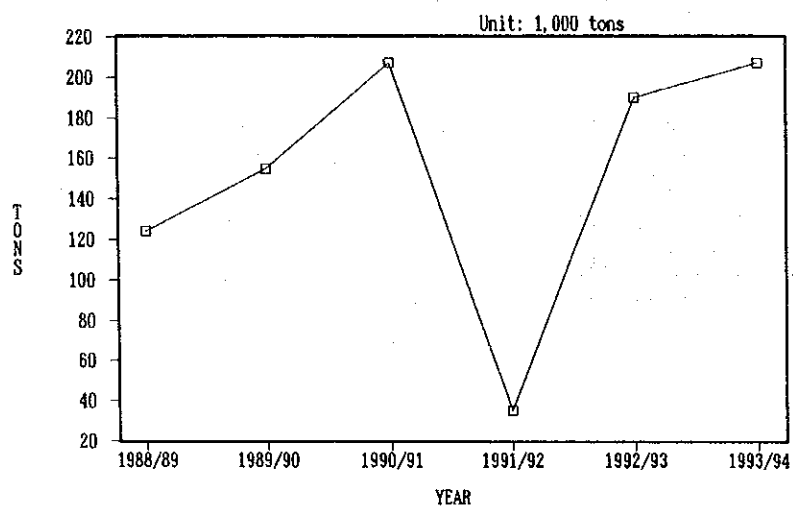


Figure A-3.5.3-34 Export Dried Fruits



volume from 1993/94 – 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	239	408

3) Salt

The volume of salt loaded at the port of Iran is as shown in Table A-3.5.3 – 15. As the data and information to determine the future trade of salt are lacking, in this report, export volume of salt is forecasted by its relation with average annual growth rate between mining sector and manufacturing sector in GDP. Average growth rate of both sector from 1993/94 – 2010/11 is 8.0%; by multiplying this rate from 1993 – 2010 by the export volume from 1993/94 – 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	63	137

(2) Liquid Bulk

1) Petroleum Product

The volume of petroleum product loaded at the port of Iran is as shown in Table A-3.5.3 – 15. As the data and information to determine the future trade of petroleum product are lacking, in this report, export volume of petroleum product is forecasted by its relation with annual growth rate of GDP. Average growth rate of GDP from 1993/94 – 2000/01 and 2000/01 – 2010/11 is 5.55% and 5.26% respectively; by multiplying this

rate from 1993 – 2010 by the export volume from 1993/94 – 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	272	454

2) Molasses

The volume of molasses loaded at the port of Iran is as shown in Table A-3.5.3 – 15. As the data and information to determine the future trade of molasses are lacking, in this report, export volume of molasses is forecasted by its relation with average annual growth rate between mining sector and manufacturing sector in GDP. Average growth rate of both sector from 1993/94 – 2010/11 is 8.0%; by multiplying this rate from 1993 – 2010 by the export volume from 1993/94 – 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	118	255

3) Liquid Gas

The volume of liquid gas loaded at the port of Iran is as shown in Table A-3.5.3 – 15. As the data and information to determine the future trade of liquid gas are lacking, in this report, export volume of liquid gas is forecasted by its relation with annual growth rate of GDP. Average growth rate of GDP from 1993/94 – 2000/01 and 2000/01 – 2010/11 is 5.55% and 5.26% respectively; by multiplying this rate from 1993 – 2010 by the export volume from 1993/94 – 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	95	159

(3) Bag Cargo

1) Chemical Material

	2000/01	2010/11
Export volume (thousand tons)	2,473	4,753

(4) Steel Material

1) Metallic Product

The volume of metallic product loaded at the port of Iran is as shown in Table A-3.5.3 - 15. As the data and information to determine the future trade of metallic product are lacking, in this report, export volume of metallic product is forecasted by its relation with annual growth rate of GDP. Average growth rate of GDP from 1993/94 - 2000/01 and 2000/01 - 2010/11 is 5.55% and 5.26% respectively; by multiplying this rate from 1993 - 2010 by the export volume from 1993/94 - 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	2,217	3,702

(5) Mineral

1) Copper

The volume of copper loaded at the port of Iran is as shown in Table A-3.5.3 - 15. As the data and information to determine the future trade of copper are lacking, in this report, export volume of copper is forecasted by its relation with annual growth rate of mining sector in GDP. Average growth rate of mining sector from 1993/94 - 2010/11 is 8.0%; by multiplying this rate from 1993 - 2010 by the export volume from 1993/94 - 2010/11, the export volume in the target years is calculated as shown below.

	2000/01	2010/11
Export volume (thousand tons)	63	137

(6) General Cargo

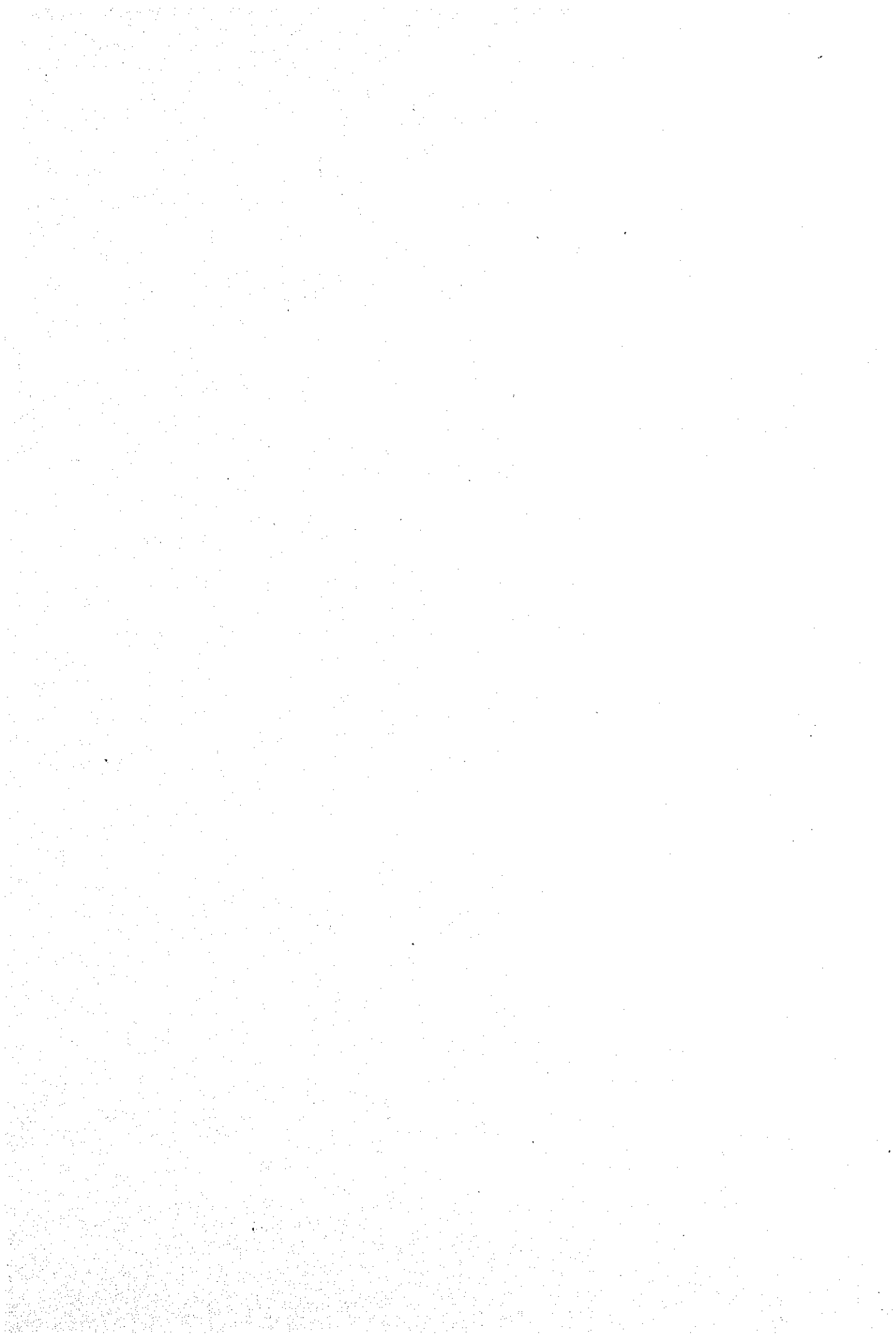
1) Dried fruits & nuts

Dried fruits & nuts loaded at the port of Iran shows a tendency to increase from 1988/89 to 1993/94(except 1991/92) as shown in Table A-3.5.3 - 15 and Figures A-3.5.3 - 34.

As one of the important export goods in Iran, dried fruits & nuts will be forecasted by the corresponding growth rate of GDP and the estimated value of GDP mentioned in Chapter 3.2.1-(3).

Future export volume of dried fruits & nuts from 1994/95 - 2010/11 is calculated using the growth rate of GDP from 1994/95 - 2010/11.

	2000/01	2010/11
Export volume (thousand tons)	302	503



APPENDIXES

Vol. (III)

**Details of Data for Master Plan
and Feasibility Study for the
Port of Imam Khomeini**

Appendix (III)-1 Planning Works

Appendix III-1.1	Transportation Rate by Railway at Imam Khomeini Port
Appendix III-1.2	Berth Occupancy Ratio at Grain Exclusive Berth
Appendix III-1.3	Required Number of Berth Using Frequency of Ship Entry and Handling Capacity
	(1)Bagged Cargo Berth
	(2)Refrigerated Cargo Berth
	(3)Steel Cargo Berth
	(4)Mineral (Bulk) Cargo Berth
	(5)General Cargo Berth
Appendix III-1.4	Required Number of Berth Using the Queuing Theory
	(1)Bagged Cargo Berth
	(2)Steel Cargo Berth
	(3)General Cargo Berth
	(4)Bagged and General Cargo
	(5)Container Cargo Berth
Appendix III-1.5	Required Number of Grain Berth
Appendix III-1.6	Vessel Size and Berth Length
Appendix III-1.7	Berth Layout of New Berth
Appendix III-1.8	Standard Road Layout
Appendix III-1.9	planned Traffic Volume
Appendix III-1.10	Layout of Conventional Berth

Appendix III-1.1 Transport Rate of Cargo Flow with Railway at Imam Khomeini Port

Area	Share of Cargo	Rate of Railway	Total
Tehran	0.450	0.29	0.13050
Esfahan	0.067	0.21	0.01407
Ahvaz	0.075	0.21	0.01575
Arak	0.140	0.30	0.04200
Shiraz	0.077	0.34	0.02618
Yazd	0.012	0.34	0.00408
Kerman	0.072	0.00	0.00000
Mashhad	0.107	0.30	0.03210
Total	1.000		0.26468

Assumptions: Share of cargo volume to/from the area is proportionate to population.
 Rrailway rate of cargo flow to/from port is forecasted using the cost analysis by Study Team.
 As a result, transport rate of cargo flow with railway is 0.265.

Appendix III-1.2 Berth Occupancy Ratio by Each Cargo at Exclusive Berth (1990-1992)

	Operation Days	Total Days	Berth Occupancy Ratio
Wheat	640	1,095	0.584
Barly	230	1,095	0.210
Corn	20	1,095	0.018

Appendix III-1.3

(1) Bagged Cargo

Cargo Volume(1,000ton)

	1993	2000	2010
Import	1,356	1,501	1,780
Export	1,326	1,874	3,625
Vessels		173	240

In the port, rate of 0.679 to total bagged cargo is handled by Radi Chemical and Petlo Chemical berth.
So the rate of 0.321 tototal bagged cargo \ 1735.005

<Present Capacity>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel (DWT)	L. R. (%)
Soya	997.6	19.13	0.50	18,585	30,000	77.5
Sugar	571.0	24.21	0.39	13,601	20,000	75.9
Rice	525.6	33.48	0.69	17,234	30,000	72.1
Avg.			0.53	16,474		71.4

<Improvement>

2000		2010	
Crane	1unit	49.5 Crane+S.G.	4units 49.5
Ship gear	3units	37.5 Berth length	220m
Berth length	220m	Warehouse	
Direct delivery		Deposit	
Vessels	2000	Carrying volume	
Avg. DWT	26,000	19,500	22,500

<Max capacity>

2000		2010	
Qd =	36 t/h	Qd =	36 t/h
*	4 units	*	4 units
*	1 Unloading efficiency	*	1 Unloading efficiency
*	17 Working time 7-24	*	17 Working time 7-24
*	0.8 Working time efficiency	*	0.8 Working time efficiency
=	1,958.4 ton/day	=	1,958.4 ton/day
Berth. D =	10.48 days	Berth. D =	12.02 days
WD =	313 Working days	WD =	313 Working days
BO =	0.7 Berth occupancy	BO =	0.7 Berth occupancy
VN =	56 Vessels	VN =	77 Vessels
Berth =	2.7 (BD*VN)/WD/BO	Berth =	4.2 (BD*VN)/WD/BO
B. Length=	665 *250m	B. Length=	1057 *250m

<Note>

	DWT<15,000	DWT<30,000	<50,000	<70,000	total
	180m	220m	250m	260m	
2000	11	22	21	2	56
	0.3	0.8	1.4	0.2	2.7 632.8020168
2010	13	28	31	5	77
	0.3	1.0	2.1	0.5	4.0 944.5025459
	137516.4	448647.3	898440.5	220026.2	1704630.4

(2) Refrigerated cargo

	Cargo Volume(1,000ton)		
	1993	2000	2010
Import	117	219	410
Export	0	0	0
Vessels		28	46

<Present Capacity>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)	L.R.(%)
Meat	250	15.70	0.61	3,773	20,000	31.0
Cheese	438	22.60	0.13	9,842	30,000	27.1
Butter	326	22.60	0.13	7,325	30,000	20.8
Avg.			0.29	6,980		30.0

<Improvement>

2000		2010	
Crane	1unit	48.00 Crane+S.G.	4units
Ship gear	3units	22.5 Berth length	220m
Berth length	220m	Warehouse	
Warehouse		Deposit	
Vessels	2000	Carrying volume	
Avg. DWT	26,000	7,800	9,000

<Max capacity>

2000		2010	
Qd =	29 t/h	Qd =	29 t/h
*	4 units	*	4 units
*	1.0 Unloading efficiency	*	1.0 Unloading efficiency
*	17 Working time 7-24	*	17 Working time 7-24
*	0.8 Working time efficiency	*	0.8 Working time efficiency
=	1,571 ton/day	=	1,571 ton/day
Berth. D =	5.26 days	Berth. D =	6.02 days
WD =	313 Working days	WD =	313 Working days
BO =	0.70 Berth occupancy	BO =	0.70 Berth occupancy
VN =	28 Vessels	VN =	46 Vessels
Berth =	0.67 (BD*VN)/WD/BO	Berth =	1.25 (BD*VN)/WD/BO
B. Length=	148 *220m	B. Length=	275 *220m

(3)Steel Material

	1993	2000	2010
Import	759	2,986	4,810 Including AL.powder,IR powder
Export	1,004	1,448	1,840
AL.powder		250	250 (Actual data 1993)
IR.powder		900	900 (Actual data 1992)
Vessels	77	180	282

<Present Capacity>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)	L.R.(%)
Iron product	2,289	8.05	0.89	16,389	30,000	65.1
Cast iron	1,151	16.71	0.42	18,750	30,000	62.5
Iron ingot	2,255	8.43	0.50	17,882	30,000	62.6
Al. ingot	749	12.00	0.67	17,136	30,000	57.1
Avg.			0.62	17,539		65.0

<Improvement>

2000		2010	
Crane	1units	62.4 Crane+S.G.	4units
Ship gear	3units	30 Berth length	220m
Berth length	220m	Warehouse	
Warehouse		Deposit	
Vessels	2000	Carrying volume	
Avg.DWT	28,000	18,200	19,500

<Max capacity>

2000		2010	
Qd =	46 t/h	Qd =	46 t/h
*	4 units	*	4 units
*	1 Unloading efficiency	*	1 Unloading efficiency
*	24 Working time 0-24	*	24 Working time 0-24
*	0.8 Working time efficiency	*	0.8 Working time efficiency
=	3,548 ton/day	=	3,548 ton/day
Berth.D =	5.75 days	Berth.D =	6.12 days
WD =	313 Working days	WD =	313 Working days
BO =	0.7 Berth occupancy	BO =	0.7 Berth occupancy
VN =	180 Vessels	VN =	282 Vessels
Berth =	4.73 (BD*VN)/WD/BO	Berth =	7.87 (BD*VN)/WD/BO
B. Length=	1,184 *250m	B. Length=	1,968 *250m

<Note>

	DWT<15,000	DWT<30,000	<50,000	<70,000	total	
	180m	220m	250m	260m		
2000	21	93	59	8	181	
	0.3	1.7	1.9	0.4	4.3	1,005
2010	14	141	109	17	281	
	0.2	2.7	3.5	0.9	7.1	1,703
	136500.0	2062125.0	2692300.0	663000.0	5553925.0	

(4)Mineral(Bulk)

	1993	2000	2010
Import	60	99	133 Excluding AL.powder,IR powder
Export	0	0	0
AL.powder		250	250 (Actual data 1993)
IR.powder		900	900 (Actual data 1992)
Vessels	53	31	29

<Present Capacity>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)	L.R.(%)
Al.powder	2,725	10	0.57	25,697	40,000	74.7
Ore powder	3,966	9.33	0.16	36,368	45,000	96.2
Ir.powder	3,986	10.07	0.43	38,425	45,000	96.6
Avg.			0.39	33,497		89

<Improvement>

2000	
Crane	2units
Berth length	240m
Yard	

2,010	
1000 Crane.	2units
Berth length	240m
Yard	

	2000	2010
Vessels		
Avg.DWT	45,000	50,000

Carrying volume	
	40,050
	44,500

<Max capacity>

2000	
Qd =	1,000 t/h
*	2 units
*	0.65 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	17,680 ton/day
Berth.D =	2.65 days
WD =	263 Working days
BO =	0.7 Berth occupancy
VN =	31 Vessels
Berth =	0.45 (BD*VN)/WD/BO
B. Length=	112 *250m

2010	
Qd =	1000 t/h
*	2 units
*	0.65 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	17,680 ton/day
Berth.D =	2.90 days
WD =	263 Working days
BO =	0.7 Berth occupancy
VN =	29 Vessels
Berth =	0.45 (BD*VN)/WD/BO
B. Length=	114 *250m

(5)General cargo

	Cargo Volume(1,000ton)		
	1993	2000	2010
Import	757	1,640	2,807
Export	13	1,122	1,666
Vessels	151	300	373

<Present Capacity>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)	L.R.(%)
Miscellaneous	546.1	9.66	0.4	5,057	30,000	40

<Improvement>

2000		2010	
Crane	0unit	30.00	Crane+S.G. 4units
Ship gear	4units	22.00	Berth length 220m
Berth length	220m		Warehouse
Warehouse			Deposit
Vessels	2000	2010	Carrying volume
Avg.DWT	23,000	30,000	9,200 12,000

<Max capacity>

2000		2010	
Qd =	22.0 t/h	Qd =	24.0 t/h
*	4 units	*	4 units
*	1 Unloading efficiency	*	1 Unloading efficiency
*	24 Working time 0-24	*	24 Working time 0-24
*	0.8 Working time efficiency	*	0.8 Working time efficiency
=	1,690 ton/day	=	1,843 ton/day
Berth.D =	5.85 days	Berth.D =	6.91 days
WD =	313 Working days	WD =	313 Working days
BO =	0.7 Berth occupancy	BO =	0.7 Berth occupancy
VN =	300 Vessels	VN =	373 Vessels
Berth =	8.0 (BD*VN)/WD/BO	Berth =	11.8 (BD*VN)/WD/BO
B. Length=	1,762 *220m	B. Length=	2,586 *220m

<Note>	DWT<15,000	DWT<30,000	DWT<50,000	DWT<70,000	total	
	180m	220m	250m	260m		
2000	3	260	20	3	286	
	0.0	6.3	0.9	0.2	7.4	1,666
2010	17	203	143	10	373	
	0.3	4.5	5.7	0.6	11.0	2,612
	102000.0	1827000.0	2288000.0	240000.0	4,457,000	

Appendix III-1.4 Required Berth Length

	1993	2000	2010
Bulk(Silo) (B)	240	240	240
Bulk(G.B.) (m)	210	180	196
Bagged (m)	366	665	1,057
Refregi. (m)	183	148	275
Steel (m)	1,171	1,184	1,968
Mineral (m)	520	112	114
General (m)	2,672	1,762	2,586
Container (m)	240	260	1,420
	5,602	4,551	7,857

<Note>

Bagged Cargo, Miscellaneous

		DWT<15,000 180m	DWT<30,000 220m	DWT<50,000 250m	DWT<70,000 260m	total
2000	Vessels	14	282	41	5	342
	Berth	0.3	7.1	2.3	0.4	10.1
2010	Vessels	30	231	174	15	450
	Berth	0.6	5.6	7.8	1.1	15.0

Bulk (grain)

		DWT<15,000 180m	DWT<30,000 220m	DWT<50,000 250m	DWT<70,000 260m	total
2000	Vessels			69	23.24054431	92
	Berth			1	0.7	1.7
2010	Vessels			63	37	101
	Berth			1	0.8	1.8

Steel

		DWT<15000 180m	DWT<30,000 220m	DWT<50,000 250m	DWT<70,000 260m	total
2000	Vessels	21	93	59	8	181
	Berth	0.3	1.7	1.9	0.4	4.3
2010	Vessels	14	141	109	17	281
	Berth	0.2	2.7	3.5	0.9	7.1

Refrege.

Mineral

		DWT<15,000 180m	DWT<30,000 220m	DWT<50,000 240m	DWT<70,000 260m	total
2000	Vessels		28	31		59
	Berth		0.7	0.4		1.1
2010	Vessels		46	29		74
	Berth		1.3	0.5		1.7

Container

		DWT<30,000 280m	DWT<40,000 320m	total
2000	Vessels	62	94	156
	Berth	1	0	1.0
2010	Vessels	404	607	1,011
	Berth	3	2	5.0

Appendix III-1.5 Required Number of Berth using the queuing theory

(1) Bagged Cargo Berth

Title =====> [MAM KHOMEINI]

Port Time ==> Open1 : 0.00 : Close1 : 24.00
 Open2 : 0.00 : Close2 : 0.00

No. of Berths ==> 5

No.	Berth Name	Crane	Length (m)	Depth (m)	Produc. (t/Hr)	Berth Time	
						Open	Close
1	BAG 1	2	180.0	10.0	50.0	0.0	24.0
2	BAG 2	2	220.0	11.0	50.0	0.0	24.0
3	BAG 3	2	250.0	13.0	50.0	0.0	24.0
4	BAG 4	2	250.0	13.0	50.0	0.0	24.0
5	BAG 5	2	260.0	14.0	50.0	0.0	24.0

No. of Ship Types ==> 4

No.	Ship Name	Ships (No.)	Ek(a) (k)	Ek(s) (k)	Gear (No.)	Crane (No.)	Prty	Length (m)	Draft (m)	Avg. Load (Hr)	Produc. (t/Hr)	Cargo (ton)
2	BAG 2	30	2	17	2	2	2	210.0	10.5	0.0	50.0	512545.0
3	BAG 3	29	2	17	2	2	1	240.0	12.5	0.0	50.0	863233.0
4	BAG 4	3	2	17	2	2	1	250.0	13.5	0.0	50.0	115097.0

1
 Costs ==> Berths

No.	Berth Name	Cost+1	Cost+2	Cost+3
1	BAG 1	0.0	0.0	0.0
2	BAG 2	0.0	0.0	0.0
3	BAG 3	0.0	0.0	0.0
4	BAG 4	0.0	0.0	0.0
5	BAG 5	0.0	0.0	0.0

Costs ==> Ships

No.	Ship Name	Cost+4	Cost+5
1	BAG 1	0.0	0.0
2	BAG 2	0.0	0.0
3	BAG 3	0.0	0.0
4	BAG 4	0.0	0.0

Notes :

- Cost+1: Crane cost while operating (\$/Hr)
- +2: Crane fixed cost (\$/year)
- +3: Berth fixed cost (\$/year)
- +4: Ship cost while loading/unloading (\$/dar)
- +5: Ship cost while waiting in the port (\$/day)

1
 Berth Allocation ==> Ships loading/unloading Berth

No.	Ship Name	Berth Number (Name)
1	BAG 1	1 (BAG 1)
		2 (BAG 2)
2	BAG 2	2 (BAG 2)
		3 (BAG 3)
		4 (BAG 4)
3	BAG 3	3 (BAG 3)
		4 (BAG 4)
		5 (BAG 5)
		5 (BAG 5)
4	BAG 4	5 (BAG 5)

Attributes for the calculation

- Que Management ---> 1
- Simulation Case ---> 3
- Output flag ---> 1

1

*** Result of POSIM (SUMMARY) ***

(I) Average Waiting Time

No.	Ship Name	----- Waiting Time -----				----- Service Time -----	
		*1	*2	*3	*4	Berthing	Loading
1	BAG 1	0.0	36.1	0.0	0.0	114.3	114.3
2	BAG 2	0.0	95.6	0.0	0.0	171.1	171.1
3	BAG 3	0.0	55.8	0.0	0.0	302.4	302.4
4	BAG 4	0.0	37.0	0.0	0.0	371.9	371.9

- Notes
- *1 : Waiting for entering ports
 - *2 : Waiting for berthing
 - *3 : Waiting for loading/unloading
 - *4 : Waiting for leaving ports

(II) Berth and Crane Utilization

No.	Berth Name	----- Berth -----		----- Crane -----
		Utilized (%)	Occupied (%)	Utilized (%)
1	BAG 1	17.0	20.7	18.0
2	BAG 2	35.2	39.8	38.7
3	BAG 3	57.5	65.2	63.1
4	BAG 4	35.0	39.2	37.0
5	BAG 5	27.7	35.1	30.2

1

(III) Annual Ship Costs (Unit : 1000)

No.	Ship Name	Waiting	Operating	Total Costs
1	BAG 1	0.0	0.0	0.0
2	BAG 2	0.0	0.0	0.0
3	BAG 3	0.0	0.0	0.0
4	BAG 4	0.0	0.0	0.0

(IV) Annual Berth Costs (Unit : 1000)

No.	Berth Name	Crane Costs		Berth Cost	Total
		Operating	Fixed	Fixed	
1	BAG 1	0.0	0.0	0.0	0.0
2	BAG 2	0.0	0.0	0.0	0.0
3	BAG 3	0.0	0.0	0.0	0.0
4	BAG 4	0.0	0.0	0.0	0.0
5	BAG 5	0.0	0.0	0.0	0.0

(2) Steel Cargo Berth

Title =====> IMAM KHOMENI

Port Time ==> Open1 : 0.00 : Close1 : 24.00
 Open2 : 0.00 : Close2 : 0.00

No. of Berths ==> 8

No.	Berth Name	Crane	Length (m)	Depth (m)	Produc. (t/Hr)	Berth Time	
						Open	Close
1	STEEL 1	2	220.0	11.0	120.0	0.0	24.0
2	STEEL 2	2	220.0	11.0	120.0	0.0	24.0
3	STEEL 3	2	220.0	11.0	120.0	0.0	24.0
4	STEEL 4	2	220.0	11.0	120.0	0.0	24.0
5	STEEL 5	2	250.0	13.0	120.0	0.0	24.0
6	STEEL 6	2	250.0	13.0	120.0	0.0	24.0
7	STEEL 7	2	250.0	13.0	120.0	0.0	24.0
8	STEEL 8	2	260.0	14.0	120.0	0.0	24.0

No. of Ship Types ==> 4

No.	Ship Name	Ships (No.)	Ek(a) (k)	Ek(s) (k)	Gear (No.)	Crane (No.)	Prtv	Length (m)	Draft (m)	Avg.Load (Hr)	Produc. (t/Hr)	Cargo (ton)
1	ST. 1	21	2	17	2	2	3	170.0	9.5	0.0	75.0	201600.0
2	ST. 2	140	2	17	2	2	2	210.0	10.5	0.0	75.0	2016000.0
3	ST. 3	107	2	17	2	2	2	240.0	12.5	0.0	75.0	2602240.0
4	ST. 4	18	2	17	2	2	1	250.0	13.5	0.0	75.0	691200.0

1
 Costs ==> Berths

No.	Berth Name	Cost+1	Cost+2	Cost+3
1	STEEL 1	0.0	0.0	0.0
2	STEEL 2	0.0	0.0	0.0
3	STEEL 3	0.0	0.0	0.0
4	STEEL 4	0.0	0.0	0.0
5	STEEL 5	0.0	0.0	0.0
6	STEEL 6	0.0	0.0	0.0
7	STEEL 7	0.0	0.0	0.0
8	STEEL 8	0.0	0.0	0.0

Costs ==> Ships

No.	Ship Name	Cost+4	Cost+5
1	ST. 1	0.0	0.0
2	ST. 2	0.0	0.0
3	ST. 3	0.0	0.0
4	ST. 4	0.0	0.0

Notes :

- Cost+1: Crane cost while operating (\$/Hr)
- +2: Crane fixed cost (\$/year)
- +3: Berth fixed cost (\$/year)
- +4: Ship cost while loading/unloading (\$/dar)
- +5: Ship cost while waiting in the port (\$/day)

1
 Berth Allocation ==> Ships loading/unloading Berth

No.	Ship Name	Berth Number (Name)
1	ST. 1	1 (STEEL 1) 2 (STEEL 2) 3 (STEEL 3) 4 (STEEL 4)
2	ST. 2	1 (STEEL 1) 2 (STEEL 2) 3 (STEEL 3) 4 (STEEL 4)
3	ST. 3	5 (STEEL 5) 6 (STEEL 6)

7 (STEEL 7)
 8 (STEEL 8)
 4 ST. 4 8 (STEEL 8)

Attributes for the calculation

* Que Management ---> 1
 * Simulation Case ---> 3
 * Output flag ---> 1

1
 *** Result of POSIM (SUMMARY) ***

(I) Average Waiting Time

No.	Ship Name	Waiting Time				Service Time	
		*1	*2	*3	*4	Berthing	Loading
1	ST. 1	0.0	0.5	0.0	0.0	40.3	40.3
2	ST. 2	0.0	0.5	0.0	0.0	59.9	59.9
3	ST. 3	0.0	68.9	0.0	0.0	100.4	100.4
4	ST. 4	0.0	23.0	0.0	0.0	162.3	162.3

Notes *1 : Waiting for entering ports
 *2 : Waiting for berthing
 *3 : Waiting for loading/unloading
 *4 : Waiting for leaving ports

(II) Berth and Crane Utilization

No.	Berth Name	Berth		Crane
		Utilized (%)	Occupied (%)	Utilized (%)
1	STEEL 1	52.6	57.6	57.0
2	STEEL 2	31.7	35.7	34.5
3	STEEL 3	11.0	13.6	12.4
4	STEEL 4	2.2	6.7	2.4
5	STEEL 5	47.9	51.6	50.4
6	STEEL 6	34.7	37.8	36.6
7	STEEL 7	21.0	23.9	21.9
8	STEEL 8	41.4	45.2	44.7

(III) Annual Ship Costs (Unit : 1000)

No.	Ship Name	Waiting	Operating	Total Costs
1	ST. 1	0.0	0.0	0.0
2	ST. 2	0.0	0.0	0.0
3	ST. 3	0.0	0.0	0.0
4	ST. 4	0.0	0.0	0.0

(IV) Annual Berth Costs (Unit : 1000)

No.	Berth Name	Crane Costs		Berth Cost	Total
		Operating	Fixed	Fixed	
1	STEEL 1	0.0	0.0	0.0	0.0
2	STEEL 2	0.0	0.0	0.0	0.0
3	STEEL 3	0.0	0.0	0.0	0.0
4	STEEL 4	0.0	0.0	0.0	0.0
5	STEEL 5	0.0	0.0	0.0	0.0
6	STEEL 6	0.0	0.0	0.0	0.0
7	STEEL 7	0.0	0.0	0.0	0.0
8	STEEL 8	0.0	0.0	0.0	0.0

(3) General Cargo Berth

Title =====> (MIAM KHOMEIN)

Port Time ==> Open1 : 0.00 : Close1 : 24.00
 Open2 : 0.00 : Close2 : 0.00

No. of Berths ==> 12

No.	Berth Name	Crane	Length (m)	Depth (m)	Produc. (t/Hr)	Berth Time Open Close	
1	GENE 1	2	180.0	10.0	71.0	0.0	24.0
2	GENE 2	2	220.0	11.0	71.0	0.0	24.0
3	GENE 3	2	220.0	11.0	71.0	0.0	24.0
4	GENE 4	2	220.0	11.0	71.0	0.0	24.0
5	GENE 5	2	220.0	11.0	71.0	0.0	24.0
6	GENE 6	2	220.0	11.0	71.0	0.0	24.0
7	GENE 7	2	220.0	11.0	71.0	0.0	24.0
8	GENE 8	2	250.0	13.0	71.0	0.0	24.0
9	GENE 9	2	250.0	13.0	71.0	0.0	24.0
10	GENE 10	2	250.0	13.0	71.0	0.0	24.0
11	GENE 11	2	250.0	13.0	71.0	0.0	24.0
12	GENE 12	2	260.0	14.0	71.0	0.0	24.0

No. of Ship Types ==> 4

No.	Ship Name	Ships (No.)	Ek(a) (k)	Ek(s) (k)	Gear (No.)	Crane (No.)	Prtg	Length (m)	Draft (m)	Avg. Load (Hr)	Produc. (t/Hr)	Cargo (ton)
1	GN 1	20	2	17	2	2	3	170.0	9.5	0.0	50.0	105100.0
2	GENE 2	248	2	17	2	2	2	210.0	10.5	0.0	50.0	1324660.0
3	GN 3	175	2	17	2	2	1	240.0	12.5	0.0	50.0	2289000.0
4	GN 4	13	2	17	2	2	3	250.0	13.5	0.0	50.0	255060.0

1
 Costs ==> Berths

No.	Berth Name	Cost-1	Cost-2	Cost-3
1	GENE 1	0.0	0.0	0.0
2	GENE 2	0.0	0.0	0.0
3	GENE 3	0.0	0.0	0.0
4	GENE 4	0.0	0.0	0.0
5	GENE 5	0.0	0.0	0.0
6	GENE 6	0.0	0.0	0.0
7	GENE 7	0.0	0.0	0.0
8	GENE 8	0.0	0.0	0.0
9	GENE 9	0.0	0.0	0.0
10	GENE 10	0.0	0.0	0.0
11	GENE 11	0.0	0.0	0.0
12	GENE 12	0.0	0.0	0.0

Costs ==> Ships

No.	Ship Name	Cost-4	Cost-5
1	GN 1	0.0	0.0
2	GENE 2	0.0	0.0
3	GN 3	0.0	0.0
4	GN 4	0.0	0.0

Notes :

- Cost-1: Crane cost while operating (\$/Hr)
- *2: Crane fixed cost (\$/year)
- *3: Berth fixed cost (\$/year)
- *4: Ship cost while loading/unloading (\$/dar)
- *5: Ship cost while waiting in the port (\$/day)

1
 Berth Allocation ==> Ships loading/unloading Berth

No.	Ship Name	Berth Number (Name)
1	GN 1	1 (GENE 1) 2 (GENE 2)
2	GENE 2	2 (GENE 2)

(4) Bagged and General Cargo

Title =====> Imam Khomeini Port

Port Time ==> Open1 : 0.00 : Close1 : 24.00
 Open2 : 0.00 : Close2 : 0.00

No. of Berths ==> 16

No.	Berth Name	Crane	Length (m)	Depth (m)	Produc. (t/Hr)	Berth Time	
						Open	Close
1	BAG 1	2	180.0	10.0	50.0	0.0	24.0
2	BAG 2	2	220.0	11.0	50.0	0.0	24.0
3	BAG 3	2	250.0	13.0	50.0	0.0	24.0
4	BAG 4	2	250.0	13.0	50.0	0.0	24.0
5	BAG 5	2	260.0	14.0	50.0	0.0	24.0
6	GENE 1	2	180.0	10.0	71.0	0.0	24.0
7	GENE 2	2	220.0	11.0	71.0	0.0	24.0
8	GENE 3	2	220.0	11.0	71.0	0.0	24.0
9	GENE 4	2	220.0	11.0	71.0	0.0	24.0
10	GENE 5	2	220.0	11.0	71.0	0.0	24.0
11	GENE 6	2	220.0	11.0	71.0	0.0	24.0
12	GENE 7	2	220.0	11.0	71.0	0.0	24.0
13	GENE 8	2	250.0	13.0	71.0	0.0	24.0
14	GENE 9	2	250.0	13.0	71.0	0.0	24.0
15	GENE 10	2	250.0	13.0	71.0	0.0	24.0
16	GENE 11	2	250.0	13.0	71.0	0.0	24.0

No. of Ship Types ==> 8

No.	Ship Name	Ships (No.)	Ek(a) (k)	Ek(s) (k)	Gear (No.)	Crane (No.)	Pty	Length (m)	Draft (m)	Avg.Load (Hr)	Produc. (t/Hr)	Cargo (ton)
2	BAG-2	30	2	17	2	2	2	210.0	10.5	0.0	50.0	512545.0
3	BAG-3	29	2	17	2	2	1	240.0	12.5	0.0	50.0	803233.0
4	BAG-4	3	2	17	2	2	1	250.0	13.5	0.0	50.0	115097.0
5	GN-1	17	2	17	2	2	3	170.0	9.5	0.0	50.0	105100.0
6	GN-2	203	2	17	2	2	2	210.0	10.5	0.0	50.0	1024660.0
7	GN-3	143	2	17	2	2	2	240.0	12.5	0.0	50.0	2299000.0
8	GN-4	10	2	17	2	2	1	250.0	13.5	0.0	50.0	256060.0

1
 Costs =====> Berths

No.	Berth Name	Cost+1	Cost+2	Cost+3
1	BAG 1	0.0	0.0	0.0
2	BAG 2	0.0	0.0	0.0
3	BAG 3	0.0	0.0	0.0
4	BAG 4	0.0	0.0	0.0
5	BAG 5	0.0	0.0	0.0
6	GENE 1	0.0	0.0	0.0
7	GENE 2	0.0	0.0	0.0
8	GENE 3	0.0	0.0	0.0
9	GENE 4	0.0	0.0	0.0
10	GENE 5	0.0	0.0	0.0
11	GENE 6	0.0	0.0	0.0
12	GENE 7	0.0	0.0	0.0
13	GENE 8	0.0	0.0	0.0
14	GENE 9	0.0	0.0	0.0
15	GENE 10	0.0	0.0	0.0
16	GENE 11	0.0	0.0	0.0

Costs =====> Ships

No.	Ship Name	Cost+4	Cost+5
1	BAG-1	0.0	0.0
2	BAG-2	0.0	0.0
3	BAG-3	0.0	0.0
4	BAG-4	0.0	0.0
5	GN-1	0.0	0.0
6	GN-2	0.0	0.0
7	GN-3	0.0	0.0
8	GN-4	0.0	0.0

```

3 ( GENE 3 )
4 ( GENE 4 )
5 ( GENE 5 )
6 ( GENE 6 )
7 ( GENE 7 )

3      GN 3      9 ( GENE 8 )
          9 ( GENE 9 )
          10 ( GENE 10 )
          11 ( GENE 11 )

4      GN 4      12 ( GENE 12 )

```

Attributes for the calculation

```

• Que Management ----> 1
• Simulation Case ----> 3
• Output flag ----> 1

```

1
--- Result of POSIM (SUMMARY) ---

(I) Average Waiting Time

No.	Ship Name	Waiting Time				Service Time	
		*1	*2	*3	*4	Berthing	Loading
1	GN 1	0.0	19.6	0.0	0.0	37.3	37.3
2	GENE 2	0.0	0.0	0.0	0.0	51.7	51.7
3	GN 3	0.0	8.2	0.0	0.0	91.8	91.8
4	GN 4	0.0	3.4	0.0	0.0	136.6	136.6

Notes *1 : Waiting for entering ports
*2 : Waiting for berthing
*3 : Waiting for loading/unloading
*4 : Waiting for leaving ports

(II) Berth and Crane Utilization

No.	Berth Name	Berth		Crane
		Utilized (%)	Occupied (%)	Utilized (%)
1	GENE 1	7.1	9.8	8.1
2	GENE 2	61.8	66.8	66.1
3	GENE 3	42.6	46.7	46.6
4	GENE 4	21.7	24.7	23.9
5	GENE 5	6.2	8.9	7.8
6	GENE 6	1.6	8.3	1.7
7	GENE 7	0.2	37.0	0.2
8	GENE 8	64.1	68.8	68.9
9	GENE 9	51.9	56.0	55.4
10	GENE 10	33.6	37.3	36.4
11	GENE 11	13.8	22.5	19.6
12	GENE 12	13.0	22.0	18.7

(III) Annual Ship Costs (Unit : 1000)

No.	Ship Name	Waiting	Operating	Total Costs
1	GN 1	0.0	0.0	0.0
2	GENE 2	0.0	0.0	0.0
3	GN 3	0.0	0.0	0.0
4	GN 4	0.0	0.0	0.0

(IV) Annual Berth Costs (Unit : 1000)

No.	Berth Name	Crane Costs		Berth Cost	Total
		Operating	Fixed	Fixed	
1	GENE 1	0.0	0.0	0.0	0.0
2	GENE 2	0.0	0.0	0.0	0.0
3	GENE 3	0.0	0.0	0.0	0.0
4	GENE 4	0.0	0.0	0.0	0.0
5	GENE 5	0.0	0.0	0.0	0.0

Notes :

- Cost-1: Crane cost while operating (\$/Hr)
- *2: Crane fixed cost (\$/year)
- *3: Berth fixed cost (\$/year)
- *4: Ship cost while loading/unloading (\$/day)
- *5: Ship cost while waiting in the port (\$/day)

1
Berth Allocation ==> Ships loading/unloading Berth

No.	Ship Name	Berth Number (Name)
1	BAG-1	1 (BAG 1) 2 (BAG 2)
2	BAG-2	2 (BAG 2) 3 (BAG 3) 11 (GENE 6) 12 (GENE 7)
3	BAG-3	3 (BAG 3) 4 (BAG 4) 16 (GENE 11)
4	BAG-4	5 (BAG 5)
5	GN-1	6 (GENE 1) 11 (GENE 6) 12 (GENE 7)
6	GN-2	8 (GENE 1) 7 (GENE 2) 8 (GENE 3) 9 (GENE 4) 10 (GENE 5) 11 (GENE 6) 12 (GENE 7)
7	GN-3	13 (GENE 8) 14 (GENE 9) 15 (GENE 10) 16 (GENE 11)
8	GN-4	5 (BAG 5)

Attributes for the calculation

- * Que Management ----> 1
- * Simulation Case ----> 3
- * Output flag ----> 1

{
*** Result of POSIM (SUMMARY) ***

(1) Average Waiting Time

No.	Ship Name	Waiting Time				Service Time	
		*1	*2	*3	*4	Berthing	Loading
1	BAG-1	0.0	38.3	0.0	0.0	115.5	115.5
2	BAG-2	0.0	0.3	0.0	0.0	163.0	163.0
3	BAG-3	0.0	24.1	0.0	0.0	281.8	281.8
4	BAG-4	0.0	71.2	0.0	0.0	374.8	374.8
5	GN-1	0.0	0.8	0.0	0.0	44.0	44.0
6	GN-2	0.0	0.6	0.0	0.0	63.3	63.3
7	GN-3	0.0	39.9	0.0	0.0	112.6	112.6
8	GN-4	0.0	40.7	0.0	0.0	262.7	262.7

- Notes
- *1 : Waiting for entering ports
 - *2 : Waiting for berthing
 - *3 : Waiting for loading/unloading
 - *4 : Waiting for leaving ports

(II) Berth and Crane Utilization

No.	Berth Name	Berth		Crane
		Utilized (%)	Occupied (%)	Utilized (%)
1	BAG 1	17.3	20.3	13.4
2	BAG 2	41.0	45.1	43.3
3	BAG 3	55.3	60.2	59.1
4	BAG 4	31.0	35.1	32.9
5	BAG 5	36.6	40.8	38.6
6	GENE 1	7.8	10.8	3.2
7	GENE 2	62.1	66.9	65.5
8	GENE 3	44.2	48.1	47.5
9	GENE 4	23.0	26.1	24.8
10	GENE 5	7.6	10.0	7.9
11	GENE 6	7.1	10.1	7.5
12	GENE 7	1.2	12.1	1.3
13	GENE 8	60.3	64.6	64.6
14	GENE 9	51.9	55.8	54.7
15	GENE 10	36.5	39.9	38.6
16	GENE 11	32.1	35.5	33.5

1

(III) Annual Ship Costs (Unit : 1000)

No.	Ship Name	Waiting	Operating	Total Costs
1	BAG-1	0.0	0.0	0.0
2	BAG-2	0.0	0.0	0.0
3	BAG-3	0.0	0.0	0.0
4	BAG-4	0.0	0.0	0.0
5	GN-1	0.0	0.0	0.0
6	GN-2	0.0	0.0	0.0
7	GN-3	0.0	0.0	0.0
8	GN-4	0.0	0.0	0.0

(IV) Annual Berth Costs (Unit : 1000)

No.	Berth Name	Crane Costs		Berth Cost	Total
		Operating	Fixed	Fixed	
1	BAG 1	0.0	0.0	0.0	0.0
2	BAG 2	0.0	0.0	0.0	0.0
3	BAG 3	0.0	0.0	0.0	0.0
4	BAG 4	0.0	0.0	0.0	0.0
5	BAG 5	0.0	0.0	0.0	0.0
6	GENE 1	0.0	0.0	0.0	0.0
7	GENE 2	0.0	0.0	0.0	0.0
8	GENE 3	0.0	0.0	0.0	0.0
9	GENE 4	0.0	0.0	0.0	0.0
10	GENE 5	0.0	0.0	0.0	0.0
11	GENE 6	0.0	0.0	0.0	0.0
12	GENE 7	0.0	0.0	0.0	0.0
13	GENE 8	0.0	0.0	0.0	0.0
14	GENE 9	0.0	0.0	0.0	0.0
15	GENE 10	0.0	0.0	0.0	0.0
16	GENE 11	0.0	0.0	0.0	0.0

(5) Container Cargo Berth

Title =====> Khomeini

Port Time ==> Open1 : 0.00 : Close1 : 24.00
 Open2 : 0.00 : Close2 : 0.00

No. of Berths ==> 5

No.	Berth Name	Crane	Length (m)	Depth (m)	Produc. (t/Hr)	Berth Time	
						Open	Close
1	con1	2	280.0	13.0	27.5	0.0	24.0
2	con2	2	280.0	13.0	27.5	0.0	24.0
3	con3	2	280.0	13.0	27.5	0.0	24.0
4	con4	2	320.0	14.0	27.5	0.0	24.0
5	con5	2	320.0	14.0	27.5	0.0	24.0

No. of Ship Types ==> 2

No.	Ship Name	Ships (No.)	Ek(a) (k)	Ek(s) (k)	Gear (No.)	Crane (No.)	Prty	Length (m)	Draft (m)	Avg.Load (Hr)	Produc. (t/Hr)	Cargo (ton)
2	cont2	404	2	1	0	2	2	310.0	13.0	0.0	0.0	404000.0

1
 Costs ==> Berths

No.	Berth Name	Cost*1	Cost*2	Cost*3
1	con1	0.0	0.0	0.0
2	con2	0.0	0.0	0.0
3	con3	0.0	0.0	0.0
4	con4	0.0	0.0	0.0
5	con5	0.0	0.0	0.0

Costs ==> Ships

No.	Ship Name	Cost*4	Cost*5
1	cont1	0.0	0.0
2	cont2	0.0	0.0

Notes :

- Cost*1: Crane cost while operating (\$/Hr)
- *2: Crane fixed cost (\$/year)
- *3: Berth fixed cost (\$/year)
- *4: Ship cost while loading/unloading (\$/dar)
- *5: Ship cost while waiting in the port (\$/day)

1
 Berth Allocation ==> Ships loading/unloading Berth

No.	Ship Name	Berth Number (Name)
1	cont1	1 (con1)
		2 (con2)
		3 (con3)
		4 (con4)
		5 (con5)
2	cont2	4 (con4)
		5 (con5)

Attributes for the calculation

- * Que Management ---> 1
- * Simulation Case ---> 3
- * Output flag ---> 1

*** Result of POSIM (SUMMARY) ***

(I) Average Waiting Time

No.	Ship Name	Waiting Time				Service Time	
		-1	-2	-3	-4	Berthing	Loading
1	cont1	0.0	14.7	0.0	0.0	15.0	15.0
2	cont2	0.0	12.6	0.0	0.0	18.2	18.2

Notes
 *1 : Waiting for entering ports
 *2 : Waiting for berthing
 *3 : Waiting for loading/unloading
 *4 : Waiting for leaving ports

(II) Berth and Crane Utilization

No.	Berth Name	Berth		Crane
		Utilized (%)	Occupied (%)	Utilized (%)
1	con1	41.6	54.7	47.5
2	con2	25.7	38.3	29.4
3	con3	12.5	24.9	15.7
4	con4	35.7	48.5	47.9
5	con5	41.2	54.0	45.8

1

(III) Annual Ship Costs (Unit : 1000)

No.	Ship Name	Waiting	Operating	Total Costs
1	cont1	0.0	0.0	0.0
2	cont2	0.0	0.0	0.0

(IV) Annual Berth Costs (Unit : 1000)

No.	Berth Name	Crane Costs		Berth Cost Fixed	Total
		Operating	Fixed		
1	con1	0.0	0.0	0.0	0.0
2	con2	0.0	0.0	0.0	0.0
3	con3	0.0	0.0	0.0	0.0
4	con4	0.0	0.0	0.0	0.0
5	con5	0.0	0.0	0.0	0.0

Appendix III-1.6

Bulk Cargo(grain)

	Cargo Volume(1,000ton)					
	1993	2000	2010			
Import	2,190	3,711	4,505			
Export	0	0	0			
Vessels		92	101			
<Present Capacity>(Silo)						
Actual Qd(ton/day)	Qd:Quantity per day Md:Mooring days Bd:Berthing days CV:Avg. carrying volume =QdX(Bd-Md)					
	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)	L. R. (%)
Wheat	4,336	9.14	0.71	36,552	45,000	92.0
Barley	6,448	5.00	0.50	29,016	40,000	75.1
Corn	2,367	15.33	0.46	35,197	40,000	86.8
Avg.			0.56	33,589		89.5

<Present Facility> -13m*130m
 <Improvement> Repairing of unloader 2 units 1,000ton/hour
 Keeping berth length 200m
 Keeping depth -13m

Vessels	2000	2010	Carrying volume	
Avg. DWT	45,000	50,000	40,275	44,750

<Max capacity>

2000	
Qd =	1,000 t/h
*	2 units
*	0.7 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	19,040 ton/day
Berth. D =	2.67 days
	263 Working days
	0.7 Berth occupancy
	1.00 Berth

2010	
Qd =	1,000 t/h
*	2 units
*	0.7 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	19,040 ton/day
Berth. D =	2.91 days
	263 Working days
	0.7 Berth occupancy
	1.00 Berth

Ope. days=	184.1 days
Vessels =	68.9 (Ope. days/Berth. D)
Qy =	2,774,987 ton/year

Ope. days=	184.1 days
Vessels =	63 (Ope. days/Berth. D)
Qy =	2,834,030 ton/year

General Berth 23 vessels berthing

General Berth 37 vessels berthing

Bulk cargo (grain)

<present capacity (general berth)>

	Qd(t/d)	Bd(days)	Md(days)	CV(ton)	Vessel(DWT)
Wheat	1,209	32.50	0.36	38,857	40,000
Corn	1,101	30.68	0.50	33,219	40,000
Barley	791	36.33	0.66	28,215	40,000
Avg.			0.51	33,430	

<Improvement>

2000		
Pneumatic unloader	2units	280ton/h
Berth length	240m	

2010		
Pneumatic unloader	4units	280ton/h
Berth length	240m	

Direct delivery

Warehouse
Deposit

Vessels	2000	2010
Avg. DWT	45,000	50,000

Carrying volume	2000	2010
	40,275	44,750

<Max capacity>

2000	
Qd =	280 t/h
*	2 units
*	0.75 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	5,712 ton/day
Berth. D =	7.56 days
WD =	362 Working days
BO =	1 Berth occupancy
VN =	23.2 Vessels
Berth =	0.7 (BD*VN)/WD/BO
B. Length=	180 *260m

2010	
Qd =	280 t/h
*	4 units
*	0.75 Unloading efficiency
*	17 Working time 7-24
*	0.8 Working time efficiency
=	11,424 ton/day
Berth. D =	4.42 days
WD =	313 Working days
BO =	1 Berth occupancy
VN =	37 Vessels
Berth =	0.8 (BD*VN)/WD/BO
B. Length=	196 *260m

Appendix III-1.7 Vessel Size and Berth Size

Class	DWT	15,000	30,000	40,000	45,000	50,000	60,000	65,000	70,000
Grain Cargo Vessels	length	152	182	196	203	208	218	223	228
	width	20.8	27.1	30.3	31.7	33.0	35.4	36.5	37.6
	draft	8.8	10.1	10.7	11.0	11.2	11.6	11.8	12.0
General Cargo Vessels	length	147.49	185.14	203	211	219	232	239	244
	width	21.276	25.691	27.8	28.7	29.5	31.0	31.7	32.3
	draft	9.1211	11.553	12.7	13.3	13.8	14.6	15.0	15.4
Break Bulk Cargo Vessels	length	145	178	194	201	207	219	224.19	229
	width	20.9	25.9	28.4	29.4	30.4	32.2	32.961	33.7
	draft	8.6	10.5	11.4	11.8	12.2	12.9	13.156	13.4
Mineral Cargo Vessels	length	138	171	187	194	200.16	212	217	222
	width	22.5	27.7	30.2	31.3	32.344	34.2	35.0	35.8
	draft	8.1	10.1	11.1	11.5	11.873	12.6	12.9	13.2

Based on Port and Harbor Technical Institutes of Ministry of Transport of Japan

Class	DWT	15,000	30,000	40,000	45,000	50,000	60,000	65,000	70,000
General Cargo Vessels	length	153	186	201		216			235
	width	22.3	27.1	29.4		31.5			33.8
	draft	9.3	10.9	11.7		12.4			13.4

Based on Technical Standard

Class	DWT	15,000	30,000	40,000	45,000	50,000	60,000	65,000	70,000
Calling Vessel	length	152	180	195	205	215	221	230	235

Based on Actual Data in Imam Khomeini Port, 1990-1992

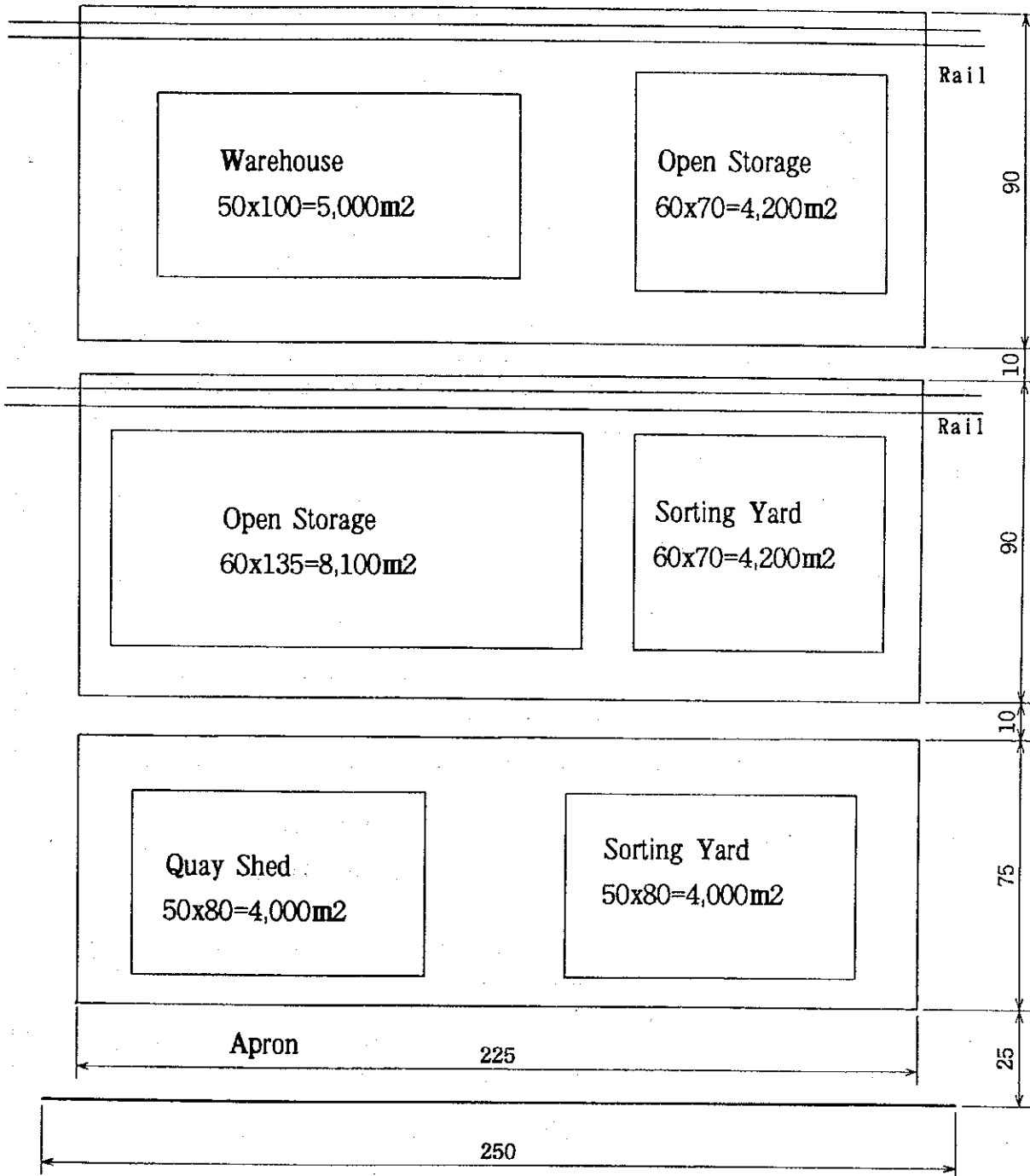
Standard Berth Length and Depth in the Master Plan

Class	DWT	15,000	30,000	40,000	45,000	50,000	60,000	65,000	70,000
Conventional Berth	length	180m	220m	240m		250m			260m
	depth	-10.0m	-11.0m	-12.0m		-13.0m			-14.0m
Grain Cargo Berth	length					240m			270m
	depth					-13.0m			-14.0m
Mineral Cargo Berth	length					240m			
	depth					-13.0m			

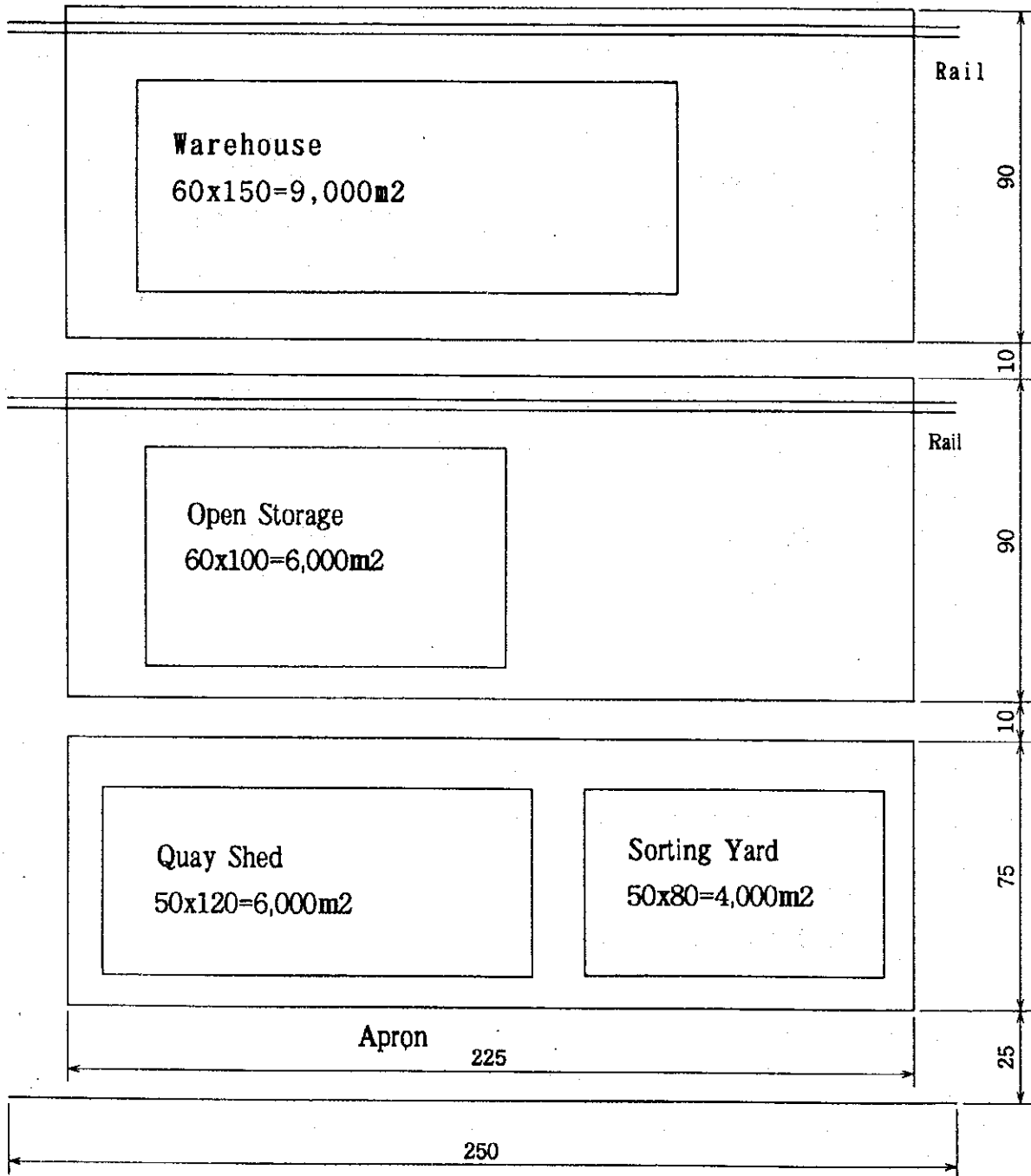
Container Cargo Vessel

	L.O.A	Breadth	Draft	DWT	Berth Length	Depth
2,000TEU	217.98	32.2	11.519	34,194		
	217.24	32.2	11.528	31,908	260m-280m	-13.0m
3,000TEU	247.85	32.22	11.517	39,157		
	251.5	32.2	11.525	39,015	280m-320m	-13.0m
Over 3,000 TEU	288.31	32.2	13.025	59,567		
	288.3	32.2	13.025	59,567	320m-360m	-14.0m

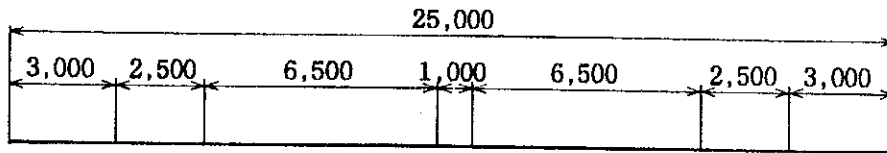
Appendix III-1.8 Standard Berth Layout (Steel Cargo Berth -13m)



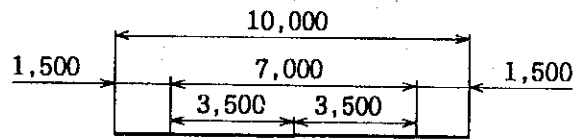
Appendix III-1.9 Standard Berth Layout (General Cargo Berth -13m)



Appendix III-1.10 Standard Layout of Roads



4 Lanes + Stooping Zone



2 Lanes

Appendix III-1.11 Planned Traffic volume

VEHICLES (TRUCKS/HOUR) = CARGO VOLUME (YEAR) x a/W x b/12 x c/30 x (1-d)/e x S

- a : SHARE BY VEHICLES = Car transportation/all transportation
- b : MONTHLY VARIATION = Cargo volume in the peak month/average monthly cargo volume
- c : DAILY VARIATION = Cargo volume on the peak day/average daily cargo volume
- W : LOADING RATIO OF TRUCKS = (ton/trucks)
- d : RATE OF RELATIVE VEHICLES = Number of related vehicles/number of trucks
- e : LOADED TRUCK RATIO = Number of loaded trucks/total number of trucks
- S : HOURLY VARIATION = Traffic generation per peak hour/daily traffic generation volume

- 0.735 * Actual
- 1.3 * Actual
- 1.5
- 16
- 0.5
- 0.5
- 0.12

2010/11 (Unit : 1,000ton)

	SILLO TERMINAL	E. W. JETTY	CONTAINER	No11-No15	No16-No20	No21-No26	No27-No31	No32-No34	New Berth	
GRAIN	2,834			1,671						4,505
BAGGED		1,134					602			1,736
STEEL					2,166				3,334	5,500
GENERAL		244			500	687	550	200	2,292	4,473
REFRIGI.						219				219
CONTAINER			9,402							9,402
TOTAL	2,834	1,378	9,402	1,671	2,666	906	1,152	200	5,626	25,835
VEHICLES	254	123	842	150	239	81	103	18	504	2,314

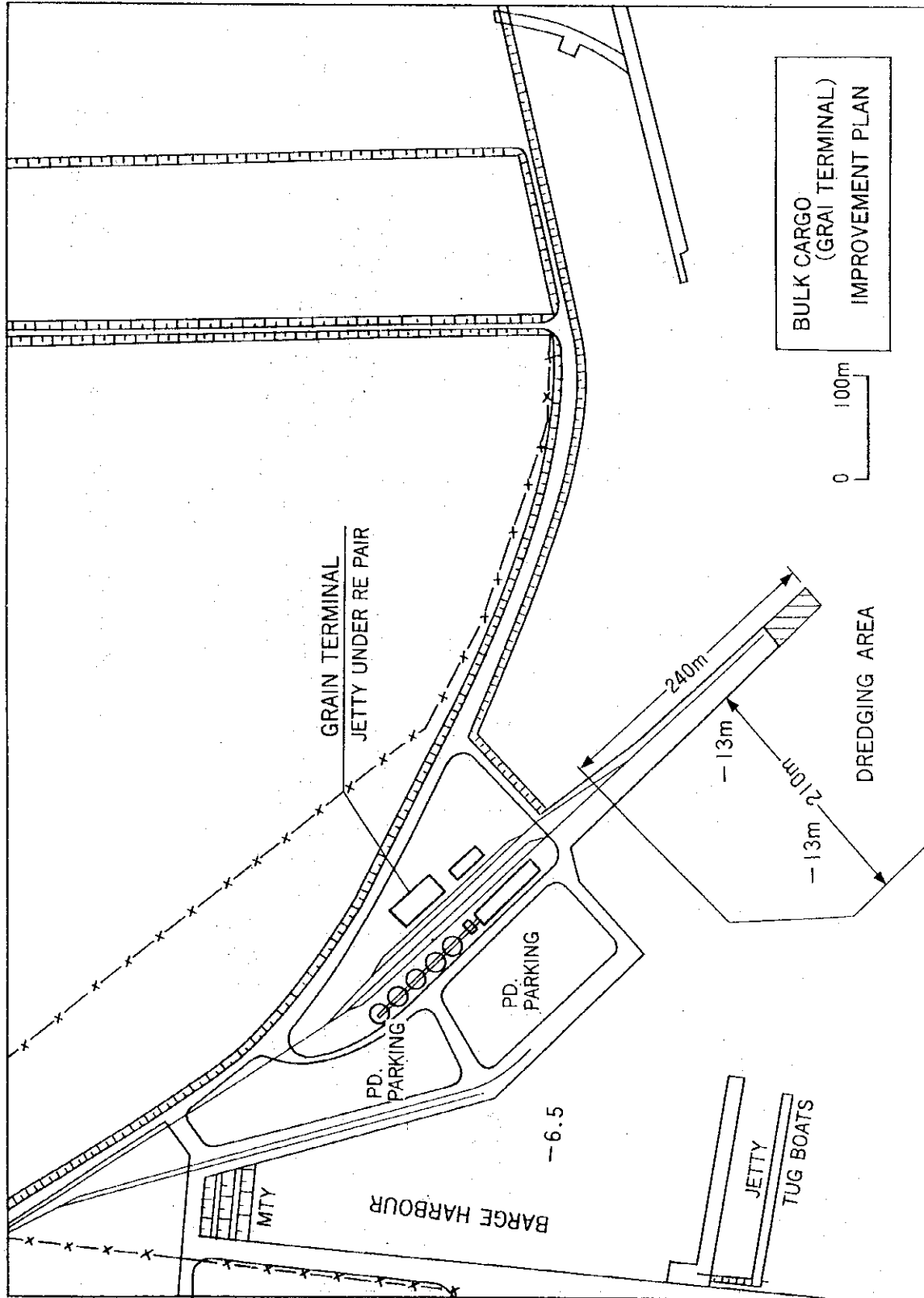
(Trucks/Hour)

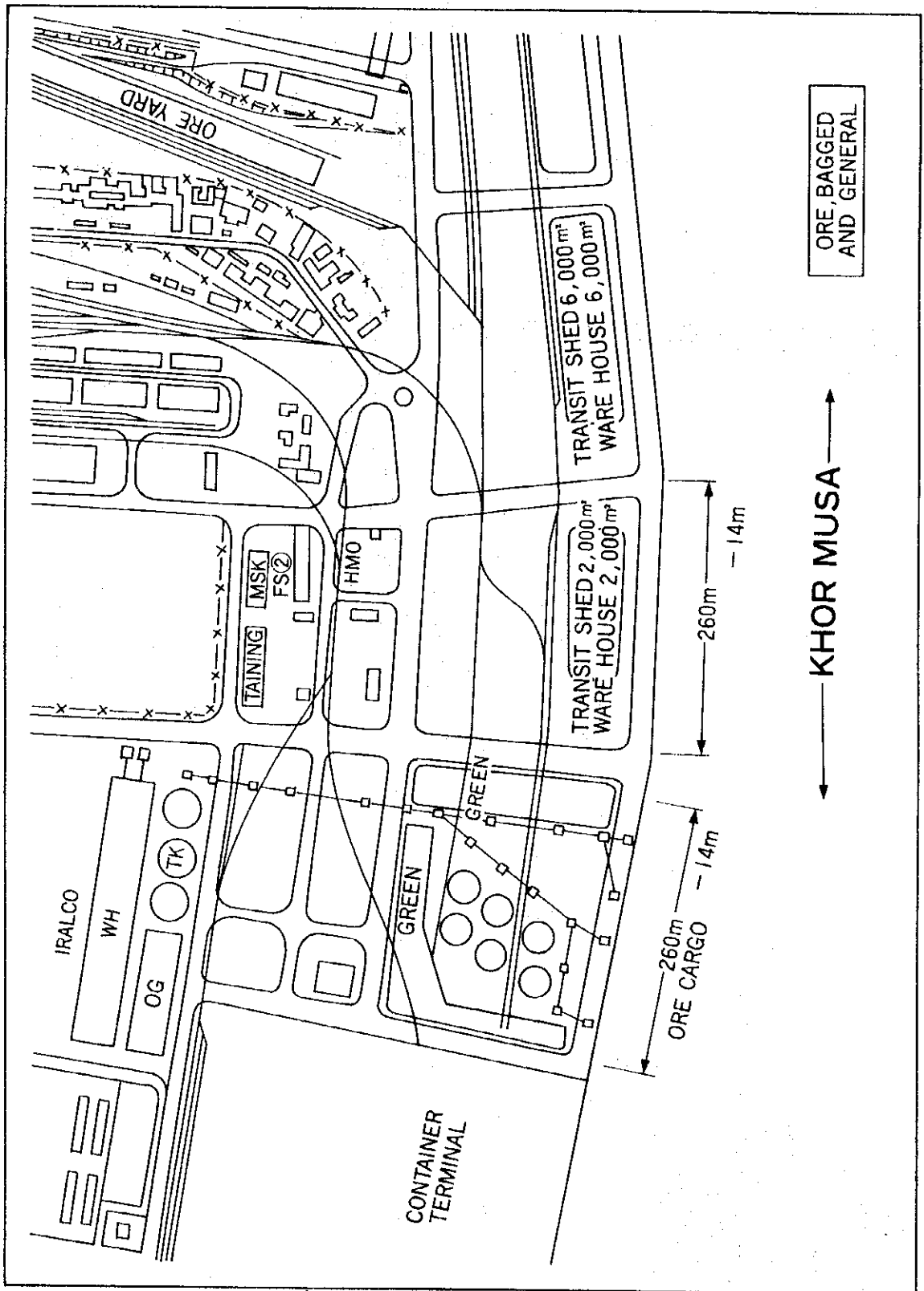
2000/01 (Unit : 1,000ton)

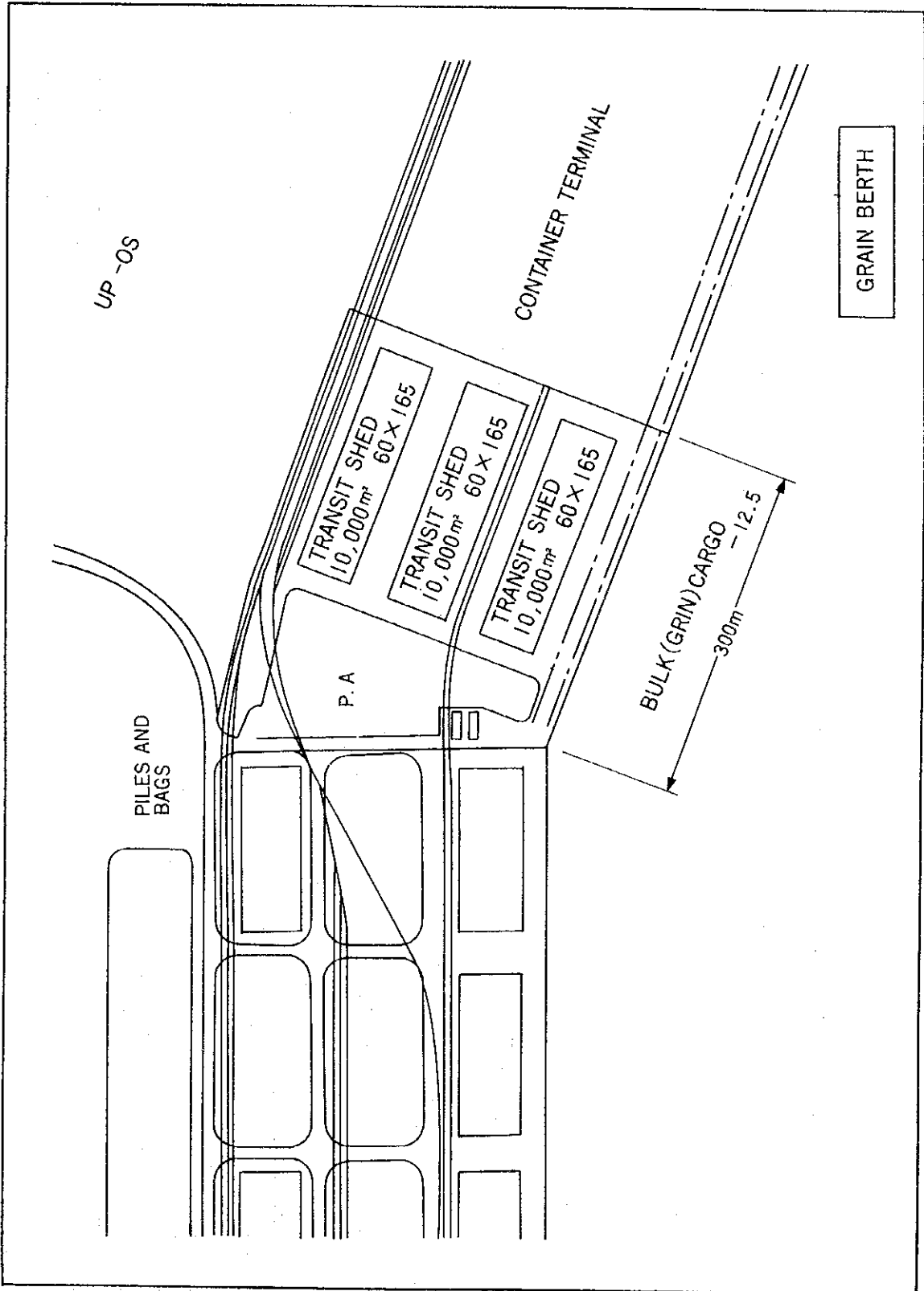
	SILLO TERMINAL	E. W. JETTY	CONTAINER	No11-No15	No16-No20	No21-No26	No27-No31	No32-No34	New Berth	
GRAIN	2,775			936						3,711
BAGG		100	0	542	231	100	110			1,083
STEEL			0	1,724	1,560					3,284
GENERAL		106	340	60	0	846	1,410			2,762
REFRIGI.					0	410				410
CONTAINER			0	1,459						1,459
TOTAL	2,775	206	340	4,721	1,791	1,356	1,520	0	0	12,709
VEHICLES	249	18	30	423	160	121	136	0	0	1,138

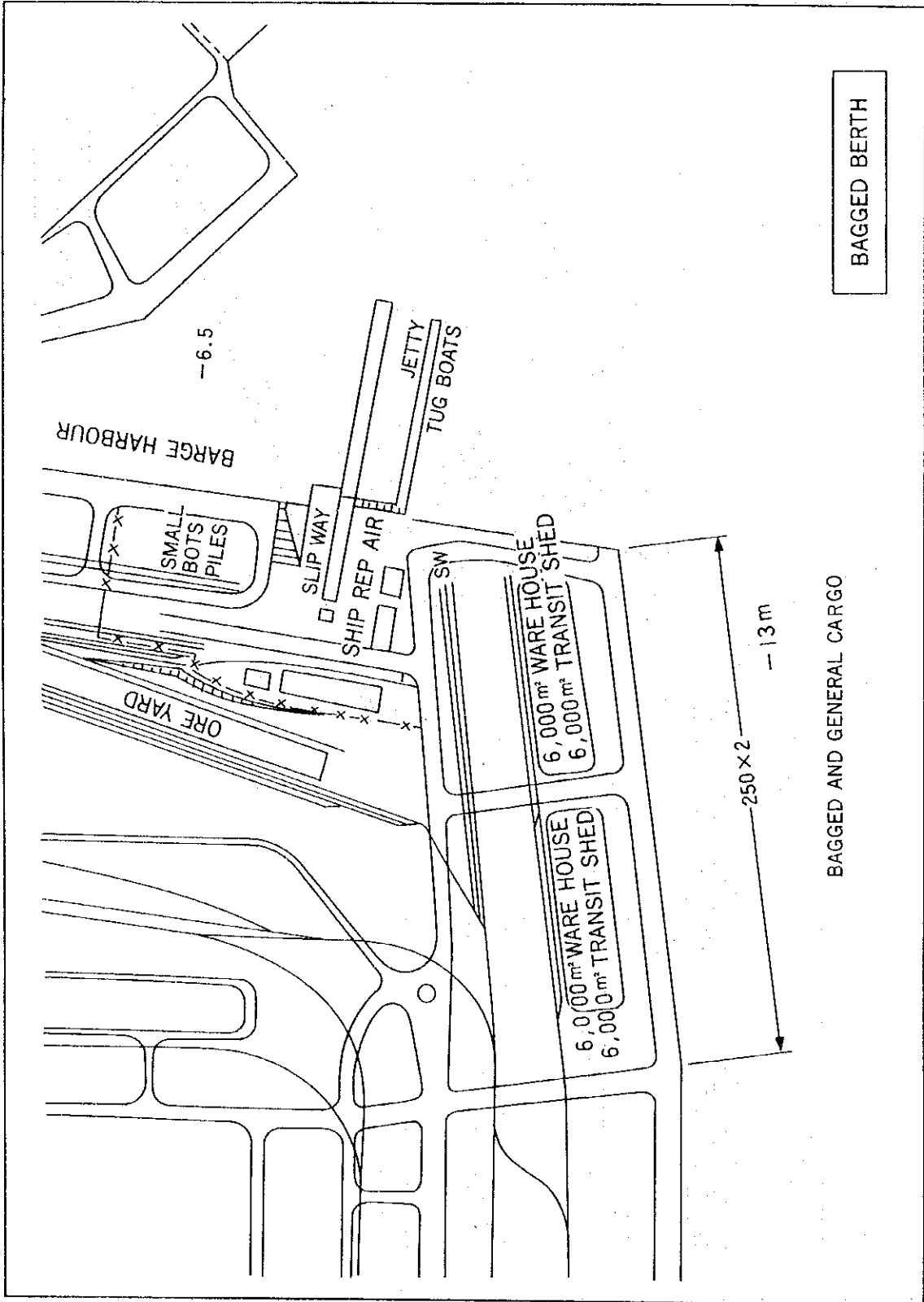
(TRUCKS/HOUR)

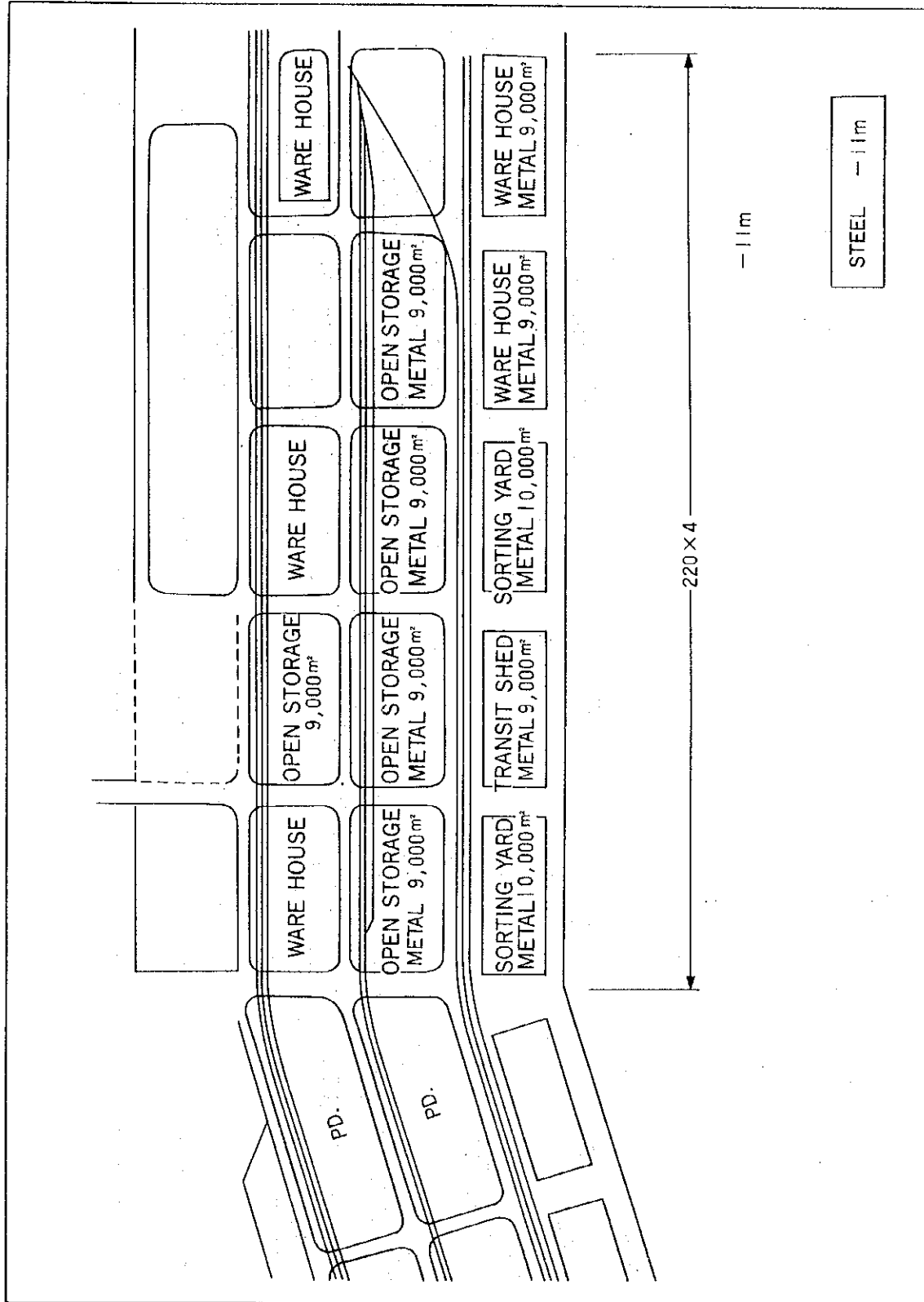
Appendix III-1.12 Layout of Conventional Berth

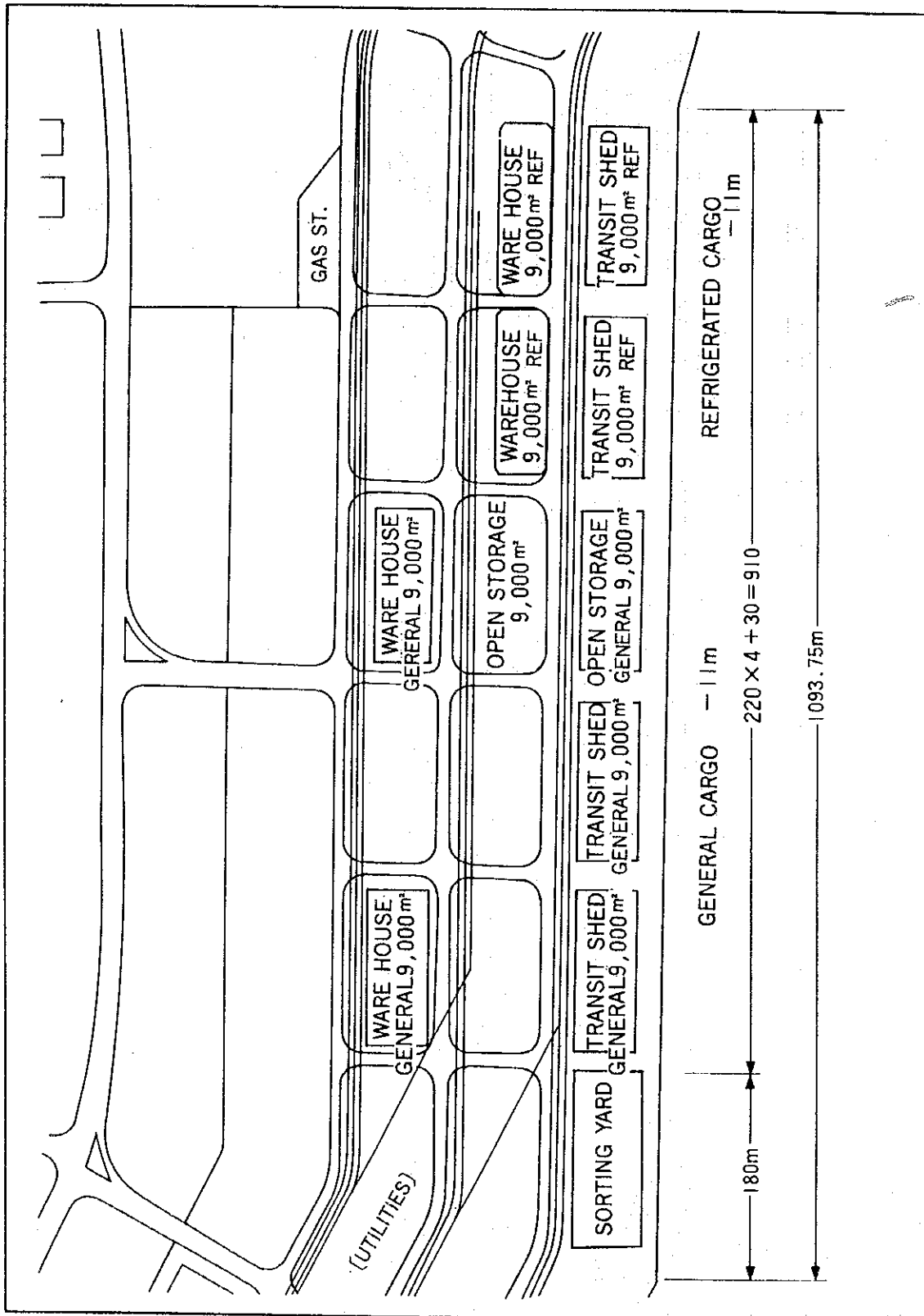


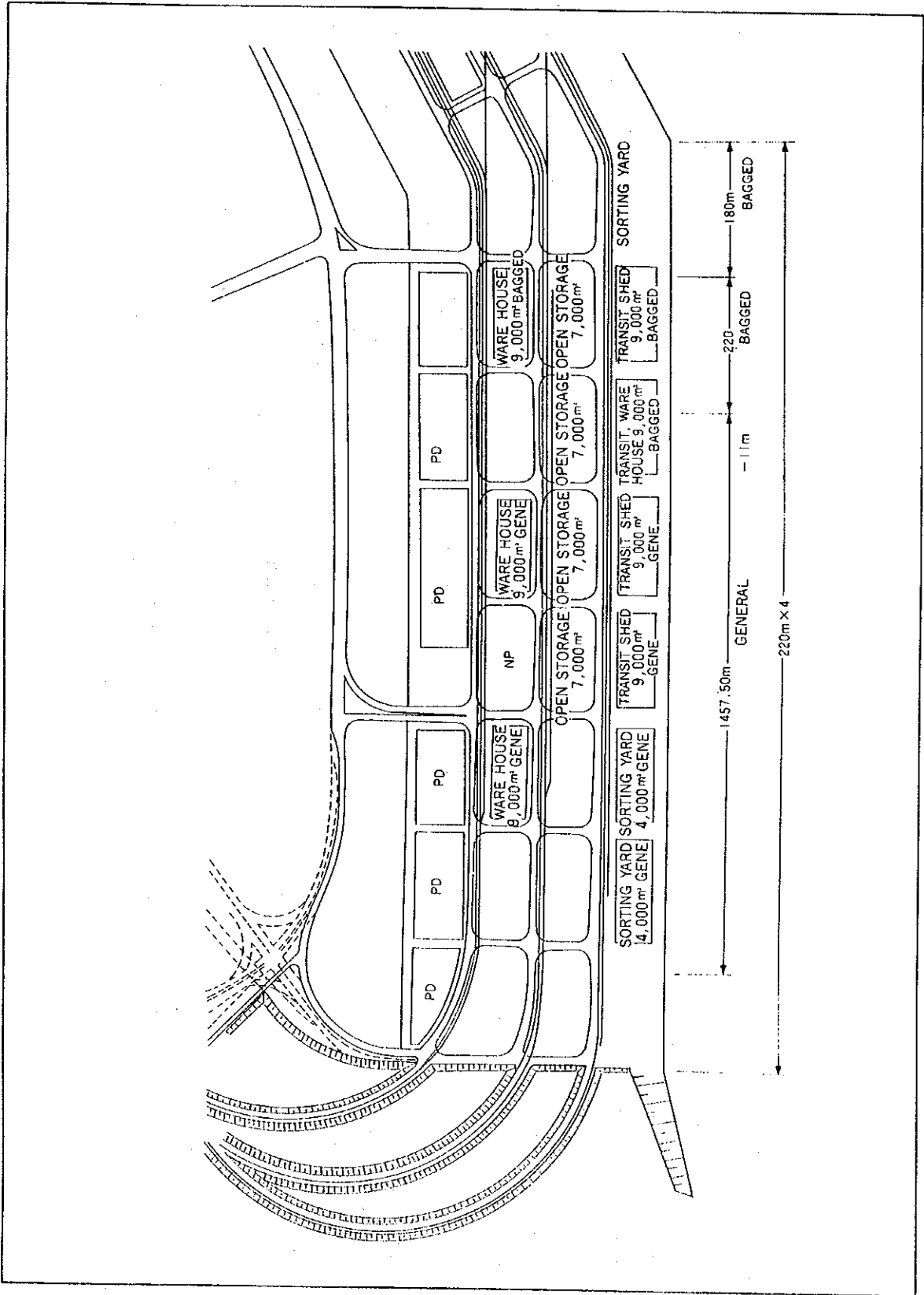


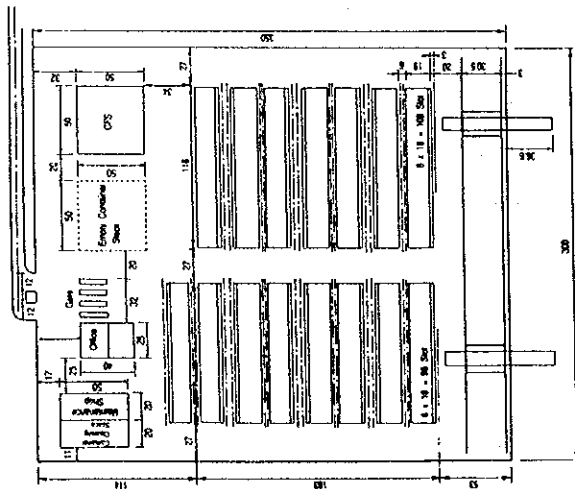




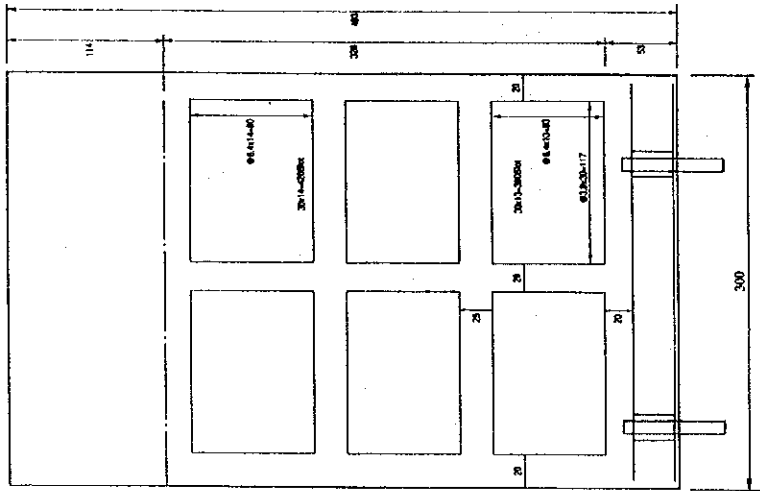




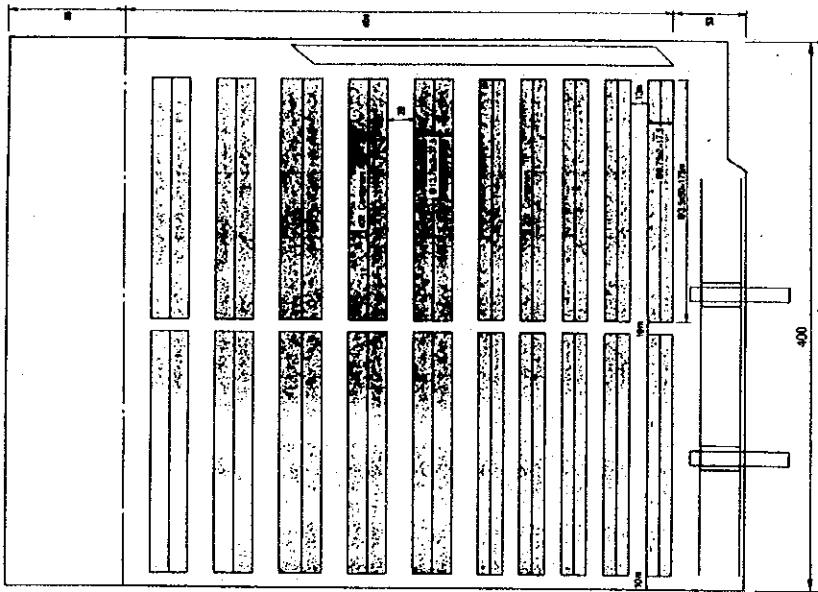




(A) Short Term Plan Transfer Crane System



(B) Straddle Carrier System



(C) All Chassis System

Figure 5.3.2-1 Typical Layouts of Container Terminal

Appendix (III)-2 Survey Data

- III-2.1 Structural Observation in 1994
- III-2.2 Sounding survey in 1994
- III-2.3 Project Cost Summary, (1) Previous Project Cost
- III-2.4 Project Cost Summary, (2) New Development
- III-2.5 Project Cost Summary, (3) Existing Facility

Appendix III-2.1 Structural Observation in 1994

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
Berth 11 ~ 34	Pile (No.)	3,718	-	3,591	7	66	54	-	-
	Pile (index)	-	-	96.6%	0.2%	1.8%	1.4%	-	-
	Pile cap (No.)	2,886	11,544	10,330	0	140	370	629	75
	Pile cap (index)	-	-	89.5%	0%	1.2%	3.2%	5.4%	0.7%
	Beam (No.)	6,169	-	5,108	1	75	312	649	24
	Beam (index)	-	-	82.7%	0.1%	1.2%	5.1%	10.5%	0.4%
	Cap. beam (No.)	448	-	312	0	10	26	30	70
	Cap. beam (index)	-	-	69.6%	0	2.3%	5.8%	6.7%	15.6%
	Slab (No.)	3,048	-	3,042	0	1	2	3	-
	Slab (index)	-	-	99.7%	0	0.1%	0.1%	0.1%	-

Berth No. 11~15 (5 Berths)

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
	Pile (No.)	702	-	694	3	5	-	-	-
	Pile (index)	-	-	98.9%	0.4%	0.7%	-	-	-
	Pile cap (No.)	390	1,560	949	0	55	145	336	75
	Pile cap (index)	-	-	60.8%	0%	3.5%	9.3%	21.6%	4.8%
	Beam (No.)	1,194	-	1,072	0	7	24	90	1
	Beam (index)	-	-	89.8%	0	0.6%	2.0%	7.5%	0.1%
	Cap. beam (No.)	156	-	54	0	9	13	22	58
	Cap. beam (index)	-	-	34.6%	0	5.8%	8.3%	14.1%	37.2%
	Slab (No.)	648	-	642	0	1	2	3	-
	Slab (index)	-	-	99.0%	-	0.2%	0.3%	0.5%	-

Berth No. 16~20 (5 Berths)

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
	Pile (No.)	819	-	818	1	-	-	-	-
	Pile (index)	-	-	99.9%	0.1%	-%	-	-	-
	Pile cap (No.)	663	2,652	2,558	-	25	39	30	
	Pile cap (index)	-	-	96.4%	-%	1.0%	1.5%	1.1%	
	Beam (No.)	1,404	-	907	1	44	192	241	19
	Beam (index)	-	-	64.6%	0.1%	3.1%	13.7%	17.2%	1.3%
	Cap. beam (No.)	77	-	71	0	0	4	1	1
	Cap. beam (index)	-	-	92.2%	0	0%	5.2%	1.3%	1.3%
	Slab (No.)	672	-	672	-	-	-	-	-
	Slab (index)	-	-	100%	-	-	-	-	-

Berth No. 21~26

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
	Pile (No.)	793	-	788	1	0	4	0	0
	Pile (index)	-	-	99.4%	0.1%	0%	0.5%	0%	0%
	Pile cap (No.)	754	3,016	2,622	0	50	127	217	0
	Pile cap (index)	-	-	85.0%	0%	1.9%	4.8%	8.3%	0%
	Beam (No.)	1,406	-	1,211	0	4	47	144	0
	Beam (index)	-	-	86.1%	0%	0.3%	3.4%	10.2%	0%
	Cap. beam (No.)	91	-	87	0	0	3	1	0
	Cap. beam (index)	-	-	95.6%	0%	0%	3.3%	1.1%	0%
	Slab (No.)	768	-	768	0	0	0	0	0
	Slab (index)	-	-	%				%	

Berth No. 27~34

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
	Pile (No.)	1,404	-	1,291	2	61	50	0	0
	Pile (index)	-	-	96.4%	0.1%	4.3%	3.6%	0%	0%
	Pile cap (No.)	1,079	4,316	4,201	0	10	59	46	0
	Pile cap (index)	-	-	97.3%	0%	0.2%	1.4%	1.1%	0%
	Beam (No.)	2,165	-	1,918	0	20	49	174	4
	Beam (index)	-	-	87.2%	0%	0.9%	2.3%	8.0%	0.2%
	Cap. beam (No.)	124	-	100	0	1	6	6	11
	Cap. beam (index)	-	-	80.7%	0%	0.8%	4.8%	4.8%	8.9%
	Slab (No.)	960	-	960	0	0	0	0	0
	Slab (index)	-	-	%				%	

Berth No. 21~34

Block	Description	Total Number	Total No. of sides	Damage Grade					
					1	2	3	4	5
	Pile (No.)	2,197	-	2,079	3	61	54	-	-
	Pile (index)	-	-	96.0%	0.1%	1.4%	2.5%	0%	0%
	Pile cap (No.)	1,835	7,332	6,823	0	60	186	263	-
	Pile cap (index)	-	-	93.1%	0%	0.8%	2.5%	3.6%	0%
	Beam (No.)	3,571	-	3,129	0	24	96	318	4
	Beam (index)	-	-	87.6%	0%	0.7%	2.7%	8.9%	0.1%
	Cap. beam (No.)	215	-	187	0	1	9	7	11
	Cap. beam (index)	-	-	%		%		%	
	Slab (No.)	1,728	-	1,728	-	-	-	-	-
	Slab (index)	-	-	100%	0	0	0	0	0

Appendix III-2.2 Sounding surbey in 1994

Hydrographic survey of Imam Khomeini port was carried out by the Study Team.
Several copy of the survey results were submitted to PSO.

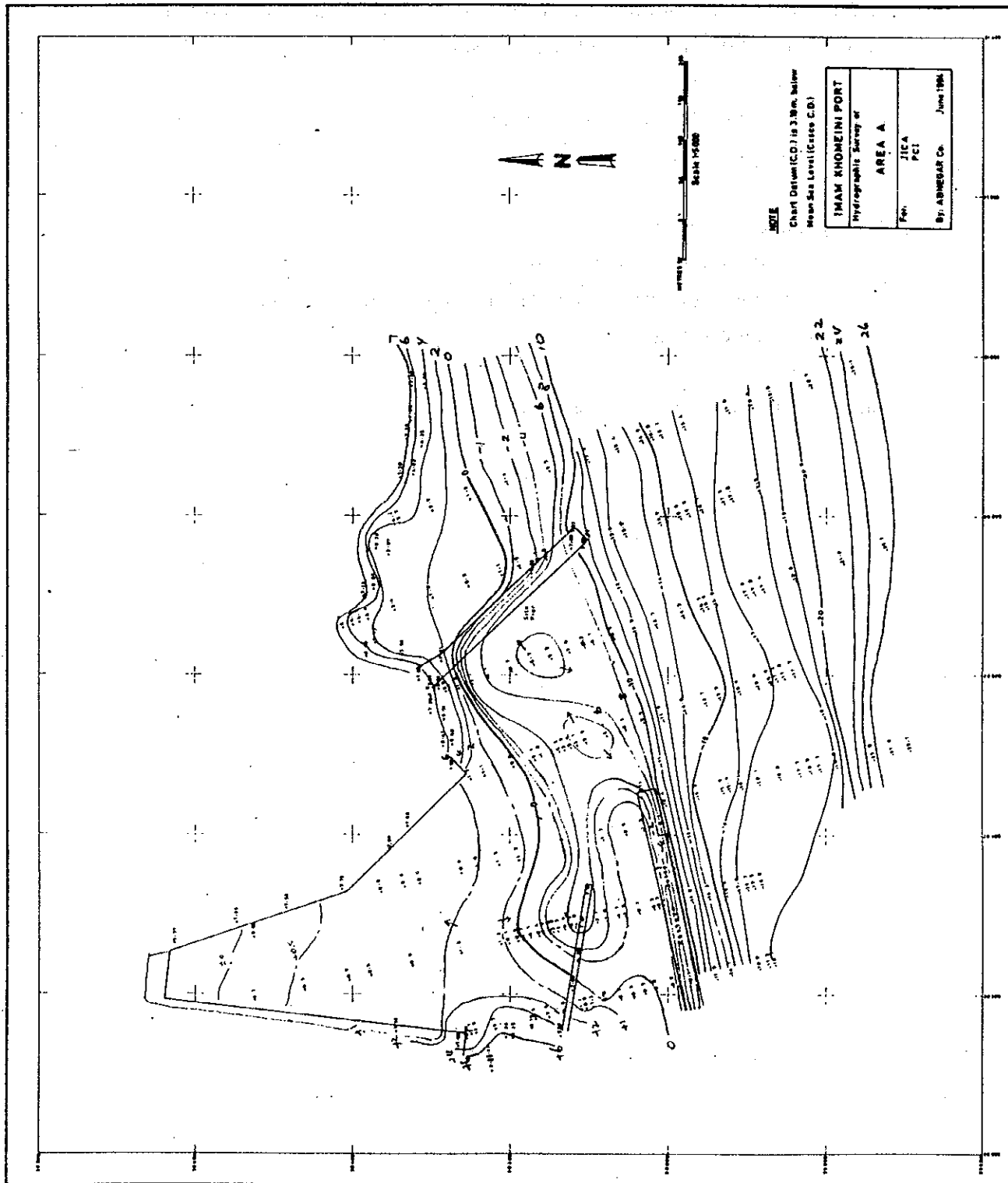
Datum : 3.10 m below Mean Sea Level (Cesco C.D)

Scale : Maps in 1:5,000

There are three survey areas.

1. Eastern Jetty to Grain Terminal
2. Conjunction area between Musa Channel and Dorag Channel
3. Zangi Channel

Sample of this survey results attached here.



0: No. 3117A

Appendix III-2.3 Project Cost summary Previous Project Cost

No.	Works and Components	Previous Contract Year						Amount M. Riels	%	Equivalent M. US Dollar	%	1973 Price		1994 Price (x 1.67)		
		72	73	74	75	76	NA					Progress M. US Dollar	Remaining M. US Dollar	Total M. US Dollar	Progress M. US Dollar	Remaining M. US Dollar
1	4 Berth Extension															
1a	Earthworks	72					384.7	24.8	6.41	100	6.41	0	10.70	10.70	0	
1b	Marine Works		73				860.0	55.3	14.33	60	8.60	5.73	23.93	14.36	9.57	
1c	Works on Land		73				310.0	19.9	5.17	70	3.62	1.55	8.64	6.05	2.59	
	Subtotal						1,554.7	100.0	25.91	72	18.63	7.28	43.27	31.11	12.16	
2.	10 Berth Extension															
2a	Earthworks		73				1,171.0	14.1	19.52	95	18.54	0.98	32.60	30.96	1.64	
2b	Marine Works			74			4,158.0	50.0	69.30	100	69.30	0	115.73	115.73	0	
2c	Roads & Utilities 1						1,504.6	18.0	25.08	70	17.56	7.52	41.89	29.33	12.56	
2d	Buildings Contract 1						725.0	8.7	12.08	75	9.06	3.02	20.20	15.13	5.07	
2e	Container Cranes						761.6	9.2	12.69	100	12.69	0	21.32	21.32	0	
	Subtotal						8,320.2	100.0	138.67	92	127.15	11.52	231.74	212.47	19.27	
3.	14 Berths Extension															
3a	Earthworks			74			1,896.9	14.0	31.62	100	31.62	0	52.81	52.81	0	
3b	Marine Works			74			4,875.0	36.1	81.25	100	81.25	0	135.69	135.69	0	
3c	Roads & Utilities						2,180.0	16.1	36.33	60	21.80	14.53	60.68	36.41	24.27	
3d	Buildings Contract						3,474.5	25.7	57.91	60	34.75	23.16	96.71	58.03	38.68	
3e	West Camp				76		117.5	0.9	1.96	100	1.96	0	3.27	3.27	0	
3f	Blids for Private Enter						611.2	4.6	10.19	0	0	10.19	17.02	0	17.02	
3g	Flyover Bridges						352.2	2.6	5.87	0	0	5.87	9.80	0	9.80	
	Subtotal						13,507.3		225.13	76	171.38	53.73	375.98	286.21	89.77	
4.	Barge Harbour															
4a	Earthworks			74	75		169.7	10.6	2.83	100	2.83	0	4.73	4.73	0	
4b	Marine Works			74			897.2	55.8	14.95	100	14.95	0	24.97	24.97	0	
4c	Works on Land						290.0	18.0	4.83	100	4.83	0	8.07	8.07	0	
4d	Quay Portal Cranes						250.0	15.6	4.17	100	4.17	0	6.96	6.96	0	
	Subtotal						1,606.9	100.0	26.78	100	26.78	0	44.73	44.73	0	
5.	ORE Import Facility															
5a	Marine Works				75		325.0	20.1	5.42	100	5.42	0	9.05	9.05	0	
5b	Mechanical Equipment				75		544.9	33.7	9.08	100	9.08	0	15.16	15.16	0	
5c	Floating Cranes			74			744.7	46.2	12.41	100	12.41	0	20.72	20.72	0	
	Subtotal						1,614.6	100.0	26.91	100	26.91	0	44.93	44.93	0	
1-5	Total (1 - 5)	72	73		75		3,622.3	13.6	60.37	98	59.40	0.97	100.82	99.20	1.62	
a.	Earthworks				75		11,115.2	41.8	185.25	97	179.52	5.73	309.37	299.80	9.57	
b.	Marine Works						4,636.8	17.4	77.28	62	47.81	29.47	129.05	79.84	49.21	
c.	Road & Utilities						4,199.5	15.8	69.99	63	43.81	26.18	116.88	73.16	43.72	
d.	Building						2,301.2	8.6	38.35	100	38.35	0	64.04	64.04	0	
e.	Equipment						728.7	2.8	12.15	16	1.96	10.19	20.29	3.27	17.02	
f.	Privates and Others						26,603.7	100.0	443.39	84	370.85	72.54	740.45	619.31	121.14	
	Total															
7.	General Port Works															
7a	Khor Musa Bar			74			571.0	25.6	9.52	100	9.52	0	15.90	15.90	0	
7b	Railway Works						1,502.9	67.3	25.05	50	12.53	12.52	41.84	20.93	20.91	
7c	High Tension Equip.						110.0	4.9	1.83	100	1.83	0	3.06	3.06	0	
7d	Telephone Installation						50.0	2.2	0.83	60	0.50	0.33	1.39	0.84	0.55	
	Subtotal						2,233.9	100.0	37.23	65	24.38	12.85	62.19	40.73	21.46	
1-7	Total (1 - 7)						3,622.3	12.6	60.37	98	59.40	0.97	100.82	99.20	1.62	
a.	Earthworks						571.0	2.0	9.52	100	9.52	0	15.90	15.90	0	
b.	Khor Musa Bar						11,115.2	38.5	185.25	97	179.52	5.73	309.37	299.80	9.57	
c.	Marine Works						4,796.8	16.6	79.95	62	50.14	29.81	133.51	83.73	49.78	
d.	Road & Utilities						1,502.9	5.2	25.05	50	12.53	12.52	41.84	20.93	20.91	
e.	Railway Works						4,199.5	14.6	69.99	63	43.81	26.18	116.88	73.16	43.72	
f.	Building						2,301.2	8.0	38.35	100	38.35	0	64.04	64.04	0	
g.	Equipment						728.7	2.5	12.15	16	1.96	10.19	20.29	3.27	17.02	
h.	Others						28,837.6	100.0	480.63	82	395.23	85.40	802.65	660.03	142.62	
	Grand total															

Source: Study Report for Fourteen Berth Extension, by Iran - Kampsak

Appendix III-2.4

Imam Khomeini Port Estimation: Summary

Alternative Plan 1. New Development at Dorag West Bank (LTD)

(1/4)

Work Category	Works	Unit Rate		Works		Cost US\$	
		Unit		Unit			
A	General Works					12,312,500	
B	Marine Works					196,571,000	
C	On-land Works					40,867,524	
D	Building					59,622,214	
E	Utilities					8,523,151	
F	Supplemental Works					0	
G	Others					0	
H	Subtotal (A-G)					317,896,389	
I	Contingency	Physical (10% of G)					
J	Engineering	(10% of G)					
K	Total	H+I+J					
<u>Land Use Plan</u>				<u>Earth Works</u>			
Total Area	ha	87.50	100%	Dredging	13,934,000 m3		
Wharf apron	ha	13.02	14.88	Soft (disposal)	13,934,000 x 0.15 = <u>2,090,000 m3</u>		
Inner access (Ex)	ha	0	0	Normal	" x 0.35 = 4,877,000 m3		
" (Nw)	ha	19.00	21.71	Hard (disposal)	" x 0.50 = <u>6,967,000 m3</u>		
Yard pavement (Ex)	ha	0	0	Normal (disposal)	<u>2,422,000 m3</u>		
" (Nw)	ha	29.04	33.19	Reclamation, 1,964,000 m3			
Building (Ex)	ha	0	0	Required volume,			
" (Nw)	ha	10.93	12.49	1,964,000 ÷ 0.80 = 2,455,000 m3			
Common areas (Ex)	ha	0	0	By normal	<u>2,455,000 m3</u>		
" (Nw)	ha	3.00	3.43				
Parks	ha	0.88	1.00				
Reserves	ha	11.63	13.30				

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	3	6,375,000
		Site Common Works	\$/unit	2,375,000	unit	2.5	5,937,500
		Subtotal					12,312,500
B	Marine Works	Seabed Clearance	\$/B	13,500	B	8	108,000
		Dredging & reclamation (N)	\$/m3	3.0	m3	2,455,000	7,365,000
		Dredging & reclamation (H)	\$/m3	6.0	m3	—	—
		Dredging & reclamation (R)	\$/m3	48.0	m3	—	—
		Dredging & disposal (N)	\$/m3	4.0	m3	4,512,000	18,048,000
		Dredging & disposal (H)	\$/m3	7.0	m3	6,967,000	48,769,000
		Borrowing & reclamation	\$/m3	6.7	m3	—	—
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m	200	433,600
		(2)±0.0--5.0	\$/m	3,679	m	200	735,800
		(3)-5.0--10.0	\$/m	6,946	m		
		(4)-10.0-15.0	\$/m	14,777	m		
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	1,900	105,754,000
		(5)-14.0m	\$/m	56,880	m	270	15,357,600
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
Existing Pier upgrading	\$/m2	1,674	m2				
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set		0		
	Subtotal					196,571,000	

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
C	On-land works	Soil improvement	\$/ha	625,000	ha	8.8	5,500,000
		Inner access	\$/m2	67.7	m2	190,000	12,863,000
		Back apron	\$/m2	-	m2	-	-
		Side apron	\$/m2	-	m2	-	-
		Pavement (1) Gravel pave.	\$/m2	-	m2	-	-
		(2) Light pave.	\$/m2	67.7	m2	232,320	15,728,640
		(3) Normal pave.	\$/m2	96.8	m2	58,080	5,622,144
		(4) Heavy pave. C2	\$/m2	-	m2	-	-
		(5) Heavy pave. C3	\$/m2	-	m2	-	-
		Storm water drainage	\$/ha	36,000	ha	32.04	1,153,440
		Flyover	\$/m2	2,500	m2	-	-
		Sub-total					40,867,524
		D	Building	Main Gate	\$/m2	413	m2
Control house	\$/m2			722	m2	6,000	4,332,000
Maintenance shops	\$/m2			748	m2	1,500	1,122,000
CFS. WH. TS	\$/m2			528	m2	97,200	51,321,600
Substation/Power station	\$/m2			581	m2	500	290,500
Passenger terminal	\$/m2			-	m2	-	-
Misc., building	\$/m2			442	m2	3,100	1,370,200
Weigh bridge	\$/set			57,041	set	4	228,164
Over-head passenger bridge	\$/m			-	m	-	-
Fence	\$/m			106.5	m	3,220	342,930
Park	\$/m2			11.4	m2	8,800	100,320
Landscaping	\$/m2			35.0	m2	2,900	101,500
Subtotal							59,622,214
E	Utilities	Water supply (yard main)	\$/B	63,225	B	8	505,800
		Water supply (dis.)	\$/ha	13,579	ha	87.5	1,188,163
		Fire fighting lines	\$/ha	1,500	ha	87.5	131,250
		Fire fighting car	\$/set	200,000	set	1	200,000
		Sewerage	\$/ha	2,813	ha	87.5	246,138
		Power supply (Distr.)	\$/B	352,500	B	4	1,410,000
		Power supply (P.plant)	\$/B	182,900	B	2	365,800
		Power supply (W.crane)	\$/B	152,000	B	2	304,000
		Lighting (yard)	\$/B	112,000	B	8	896,000
		Lighting (road)	\$/ha	24,000	ha	19.0	456,000
		Telecommunication	\$/ha	4,000	ha	87.5	350,000
		Reefer system	\$/B	33,000	B	-	-
		Bunker system	\$/m	1,000	m	2,170	2,170,000
Misc., utilities	\$/LS	300,000	LS	1	300,000		
Subtotal					8,523,150		

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
F	Supplemental works	Demolishing and Removal					
		Demolishing (Trestle)	\$/m2	150	m2		0
		Demolishing (Dolphins)	\$/m2	400	m2		0
		Demolishing (wharf)	\$/m2	200	m2		0
		Demolishing (jetty)	\$/m2	100	m2		0
		Demolishing (building)	\$/m2	50	m2		0
		Demolishing (onland civil)	\$/m2	50	m2		0
		Removal (building)	\$/m2	200.0	m2		0
		Removal (piles)	s/pile	500.0	piles		0
		Environmental protection			LS		0
		Misc. works			LS		0
		Sub-total					0
		G	Others	Item (1) Rail tracks	\$/m		m
Item (2)	LS				set		0
Item (3)	LS				set		0
Sub-total							0
Total A to G							317,896,387

Imam Khomeini Port Estimation: Summary

Alternative Plan 2. New Development at Zangi South Bank (LTD)

(1/4)

Work Category		Works		Unit Rate		Works		Cost US\$	
				Unit		Unit			
A	General Works							12,312,500	
B	Marine Works							276,347,100	
C	On-land Works							35,333,780	
D	Building							56,674,243	
E	Utilities							8,669,816	
F	Supplemental Works							0	
G	Others							0	
H	Subtotal (A-G)							389,337,439	
I	Contingency	Physical (10% of G)							
J	Engineering	(10% of G)							
K	Total	H+I+J							
<u>Land Use Plan</u>				<u>Earth Works</u>					
Total Area	ha	98.00	100%	Dredging	33,796,000 m ³				
Wharf apron	ha	13.20	13.47	Soft (disposal)	33,796,000 x 0.25 =		<u>8,449,000 m³</u>		
Inner access (Ex)	ha	0	0	Normal	" x 0.55 =		18,588,000 m ³		
" (Nw)	ha	14.70	15.00	Hard (disposal)	" x 0.20 =		<u>6,759,000 m³</u>		
Yard pavement (Ex)	ha	0	0	Normal (disposal)			<u>11,389,000 m³</u>		
" (Nw)	ha	24.90	30.00	Reclamation	5,759,000 m ³				
Building (Ex)	ha	0	0	Required volume,					
" (Nw)	ha	10.48	10.69		5,759,000 + 0.80 = 7,199,000 m ³				
Common areas (Ex)	ha	0	0	By normal	<u>7,199,000 m³</u>				
" (Nw)	ha	1.50	1.53						
Parks	ha	0.98	1.00						
Reserves	ha	27.74	28.31						

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	3	6,375,000
		Site Common Works	\$/unit	2,375,000	unit	2.5	5,937,500
		Subtotal					12,312,500
B	Marine Works	Seabed Clearance	\$/B	13,500	B	8	108,000
		Dredging & reclamation (N)	\$/m3	3.0	m3	7,199,000	21,597,000
		Dredging & reclamation (H)	\$/m3	6.0	m3	-	-
		Dredging & reclamation (R)	\$/m3	48.0	m3	-	-
		Dredging & disposal (N)	\$/m3	4.0	m3	19,838,000	79,352,000
		Dredging & disposal (H)	\$/m3	7.0	m3	6,759,000	47,313,000
		Borrowing & reclamation	\$/m3	6.7	m3	-	-
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m	1,400	3,035,200
		(2)±0.0--5.0	\$/m	3,679	m	100	367,900
		(3)-5.0--10.0	\$/m	6,946	m	100	694,600
		(4)-10.0-15.0	\$/m	14,777	m	100	1,477,700
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	1,775	98,796,500
		(5)-14.0m	\$/m	56,880	m	415	23,605,200
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
		Existing Pier upgrading	\$/m2	1,674	m2		
		Ro-Ro system	LS		set		
		Breakwater	\$/m		m		
		Navigation aid	LS	5,000,000	set		0
Subtotal					276,347,100		

(3/4)

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
C	On-land works	Soil improvement	\$/ha	625,000	ha	9.80	6,125,000
		Inner access	\$/m2	67.7	m2	147,000	9,951,900
		Back apron	\$/m2	-	m2	-	-
		Side apron	\$/m2	-	m2	-	-
		Pavement (1) Gravel pave.	\$/m2	-	m2	-	-
		(2) Light pave.	\$/m2	67.7	m2	199,200	13,485,840
		(3) Normal pave.	\$/m2	96.8	m2	49,800	4,820,640
		(4) Heavy pave. C2	\$/m2	-	m2	-	-
		(5) Heavy pave. C3	\$/m2	-	m2	-	-
		Storm water drainage	\$/ha	36,000	ha	26.40	950,400
		Flyover	\$/m2	2,500	m2	-	-
Sub-total					35,333,780		
D	Building	Main Gate	\$/m2	413	m2	1,000	413,000
		Control house	\$/m2	722	m2	3,000	2,166,000
		Maintenance shops	\$/m2	748	m2	1,500	1,122,000
		CFS. WH. TS	\$/m2	528	m2	97,200	51,321,600
		Substation/Power station	\$/m2	581	m2	500	290,500
		Passenger terminal	\$/m2	-	m2	-	-
		Misc., building	\$/m2	442	m2	1,600	707,200
		Weigh bridge	\$/set	57,041	set	3	171,123
		Over-head passenger bridge	\$/m	-	m	-	-
		Fence	\$/m	106.5	m	2,400	255,600
		Park	\$/m2	11.4	m2	9,800	111,720
		Landscaping	\$/m2	35.0	m2	3,300	115,500
		Subtotal					56,674,243
		E	Utilities	Water supply (yard main)	\$/B	63,225	B
Water supply (dis.)	\$/ha			13,579	ha	98.0	1,330,742
Fire fighting lines	\$/ha			1,500	ha	98.0	147,000
Fire fighting car	\$/set			200,000	set	1	200,000
Sewerage	\$/ha			2,813	ha	98.0	275,674
Power supply (Distr.)	\$/B			352,500	B	4	1,410,000
Power supply (P.plan)	\$/B			182,900	B	2	365,800
Power supply (W.crane)	\$/B			152,000	B	2	304,000
Lighting (yard)	\$/B			112,000	B	8	896,000
Lighting (road)	\$/ha			24,000	ha	14.70	352,800
Telecommunication	\$/ha			4,000	ha	98.0	392,000
Reefer system	\$/B			33,000	B	-	-
Bunker system	\$/m			1,000	m	2,190	2,190,000
Misc., utilities	\$/LS			300,000	LS	1	300,000
Subtotal					8,669,816		

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
F	Supplemental works	Demolishing and Removal						
		Demolishing (Trestle)	\$/m2	150	m2		0	
		Demolishing (Dolphins)	\$/m2	400	m2		0	
		Demolishing (wharf)	\$/m2	200	m2		0	
		Demolishing (jetty)	\$/m2	100	m2		0	
		Demolishing (building)	\$/m2	50	m2		0	
		Demolishing (onland civil)	\$/m2	50	m2		0	
		Removal (building)	\$/m2	200.0	m2		0	
		Removal (piles)	s/pile	500.0	piles		0	
		Environmental protection			LS		0	
		Misc. works			LS		0	
		Sub-total					0	
		G	Others	Item (1) Rail tracks	\$/m		m	
Item (2)	LS				set		0	
Item (3)	LS				set		0	
Sub-total							0	
Total A to G							389,337,439	

Imam Khomeini Port Estimation: Summary

Alternative Plan 3. New Development at Dorag West Bank (LTD)

(1/4)

Work Category		Works		Unit Rate		Works		Cost US\$
				Unit		Unit		
A	General Works							13,500,000
B	Marine Works							261,027,400
C	On-land Works							52,596,662
D	Building							86,108,418
E	Utilities							12,481,588
F	Supplemental Works							0
G	Others							0
H	Subtotal (A-G)							425,714,068
I	Contingency	Physical (10% of G)						
J	Engineering	(10% of G)						
K	Total	H+I+J						
<u>Land Use Plan</u>				<u>Earth Works</u>				
Total Area	ha	132.70	100%	Dredging	15,159,000 m3			
Wharf apron	ha	19.26	14.51	Soft (disposal)	15,195,000 x 0.15 = <u>2,279,000 m3</u>			
Inner access (Ex)	ha	0	0	Normal	" x 0.35 = 5,318,000 m3			
" (Nw)	ha	26.88	20.26	Hard (disposal)	" x 0.50 = <u>7,597,000 m3</u>			
Yard pavement (Ex)	ha	0	0	Normal (disposal)	<u>2,144,000 m3</u>			
" (Nw)	ha	33.71	25.40	Reclamation	2,539,000 m3			
Building (Ex)	ha	0	0	Required volume,	2,539,000 ÷ 0.80 = 3,174,000 m3			
" (Nw)	ha	16.04	12.09	By normal	<u>3,174,000 m3</u>			
Common areas (Ex)	ha	0	0					
" (Nw)	ha	3.00	2.26					
Parks	ha	1.33	1.00					
Reserves	ha	32.49	24.48					

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	3	6,375,000
		Site Common Works	\$/unit	2,375,000	unit	3.0	7,125,000
		Subtotal					13,500,000
B	Marine Works	Seabed Clearance	\$/B	13,500	B	12	162,000
		Dredging & reclamation (N)	\$/m3	3.0	m3	3,174,000	9,522,000
		Dredging & reclamation (H)	\$/m3	6.0	m3	-	-
		Dredging & reclamation (R)	\$/m3	48.0	m3	-	-
		Dredging & disposal (N)	\$/m3	4.0	m3	4,423,000	17,692,000
		Dredging & disposal (H)	\$/m3	7.0	m3	7,597,000	53,179,000
		Borrowing & reclamation	\$/m3	6.7	m3	-	-
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m	200	433,600
		(2)±0.0--5.0	\$/m	3,679	m	200	735,800
		(3)-5.0--10.0	\$/m	6,946	m		
		(4)-10.0-15.0	\$/m	14,777	m		
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	2,690	149,725,400
		(5)-14.0m	\$/m	56,880	m	520	29,577,600
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
Existing Pier upgrading	\$/m2	1,674	m2				
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set		0		
	Subtotal					261,027,400	

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
C	On-land works	Soil improvement	\$/ha	625,000	ha	13.27	8,293,750	
		Inner access	\$/m2	67.7	m2	268,800	18,197,760	
		Back apron	\$/m2	-	m2	-	-	
		Side apron	\$/m2	-	m2	-	-	
		Pavement (1) Gravel pave.	\$/m2	-	m2	-	-	
		(2) Light pave.	\$/m2	67.7	m2	269,680	18,257,336	
		(3) Normal pave.	\$/m2	96.8	m2	67,420	6,526,256	
		(4) Heavy pave. C2	\$/m2	-	m2	-	-	
		(5) Heavy pave. C3	\$/m2	-	m2	-	-	
		Storm water drainage	\$/ha	36,000	ha	36.71	1,321,560	
		Flyover	\$/m2	2,500	m2	-	-	
		Sub-total						52,596,662
D	Building	Main Gate	\$/m2	413	m2	1,500	619,500	
		Control house	\$/m2	722	m2	3,000	2,166,000	
		Maintenance shops	\$/m2	748	m2	1,500	1,122,000	
		CFS. WH. TS	\$/m2	528	m2	151,500	79,992,000	
		Substation/Power station	\$/m2	581	m2	750	435,750	
		Passenger terminal	\$/m2	-	m2	-	-	
		Misc., building	\$/m2	442	m2	2,150	950,300	
		Weigh bridge	\$/set	57,041	set	3	171,123	
		Over-head passenger bridge	\$/m	-	m	-	-	
		Fence	\$/m	106.5	m	3,250	346,125	
		Park	\$/m2	11.4	m2	13,300	151,620	
		Landscaping	\$/m2	35.0	m2	4,400	154,000	
		Subtotal						86,108,418
		E	Utilities	Water supply (yard main)	\$/B	63,225	B	12
Water supply (dis.)	\$/ha			13,579	ha	132.7	1,801,933	
Fire fighting lines	\$/ha			1,500	ha	132.7	199,050	
Fire fighting car	\$/set			200,000	set	1	200,000	
Sewerage	\$/ha			2,813	ha	132.7	372,285	
Power supply (Distr.)	\$/B			352,500	B	6.0	2,115,000	
Power supply (P.plan)	\$/B			182,900	B	3	548,700	
Power supply (W.crane)	\$/B			152,000	B	3	456,000	
Lighting (yard)	\$/B			112,000	B	12	1,344,000	
Lighting (road)	\$/ha			24,000	ha	26.88	645,120	
Telecommunication	\$/ha			4,000	ha	132.7	530,800	
Reefer system	\$/B			33,000	B	-	-	
Bunker system	\$/m			1,000	m	3,210	3,210,000	
Misc., utilities	\$/LS			300,000	LS	1	300,000	
Subtotal						12,481,588		

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
F	Supplemental works	Demolishing and Removal					
		Demolishing (Trestle)	\$/m2	150	m2		0
		Demolishing (Dolphins)	\$/m2	400	m2		0
		Demolishing (wharf)	\$/m2	200	m2		0
		Demolishing (jetty)	\$/m2	100	m2		0
		Demolishing (building)	\$/m2	50	m2		0
		Demolishing (onland civil)	\$/m2	50	m2		0
		Removal (building)	\$/m2	200.0	m2		0
		Removal (piles)	s/pile	500.0	piles		0
		Environmental protection			LS		-
		Misc. works			LS		0
		Sub-total					0
		G	Others	Item (1) Rail tracks	\$/m		m
Item (2)	LS				set		0
Item (3)	LS				set		0
Sub-total							0
Total A to G							425,714,068

Appendix III-2.5

Imam Khomeini Port Estimation: Summary

Existing Facility Upgrading for Plan 1 or Plan 2, (LTD)

Zone 1, Old port and Former Four Berth Extension Areas

(1/4)

Work Category	Works	Unit Rate		Works		Cost
		Unit		Unit		US\$
A	General Works					8,062,500
B	Marine Works					122,615,170
C	On-land Works					23,030,234
D	Building					23,915,971
E	Utilities					5,474,773
F	Supplemental Works					13,220,500
G	Others					6,000,000
H	Subtotal (A-G)					203,319,148
I	Contingency	Physical (10% of G)				
J	Engineering	(10% of G)				
K	Total	H+I+J				
<u>Land Use Plan</u>				<u>Dredging 1,086,000 m3</u>		
Total Area	61.39 ha	100%		Soft (disposal)	1,086,00 x 0.20 =	<u>217,200 m3</u>
Wharf apron	10.41 ha	16.96		Normal	1,086,00 x 0.40 =	434,400 m3
Inner access (Ex)	3.69 ha	6.01		Hard	1,086,00 x 0.40 =	434,400 m3
" (Nw)	2.46 ha	4.01				
Yard pavement (Ex)	11.50 ha	18.73				
" (Nw)	23.36 ha	38.05				
Building (Ex)	0.25 ha	0.41		<u>Reclamation 3,140,000 m3</u>		
" (Nw)	4.47 ha	7.28		Required volume		
Common areas (Ex)	2.66 ha	4.33		3,140,000 ÷ 0.80 = 3,925,000 m3		
" (Nw)	1.98 ha	3.22		By Normal	<u>434,400 m3</u>	
Parks	0.61 ha	1.00		By Hard	<u>434,400 m3</u>	
Reserves	0.00 ha	0		Borrow	<u>3,056,200 m3</u>	

(2/4)

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	1	2,125,000
		Site Common Works	\$/unit	2,375,000	unit	2.5	5,937,500
		Subtotal					8,062,500
B	Marine Works	Seabed Clearance	\$/B	13,500	B	6	81,000
		Dredging & reclamation (N)	\$/m3	3.0	m3	868,800	2,606,400
		Dredging & reclamation (H)	\$/m3	6.0	m3	0	0
		Dredging & reclamation (R)	\$/m3	48.0	m3	0	0
		Dredging & disposal (N)	\$/m3	4.0	m3	217,200	868,800
		Dredging & disposal (H)	\$/m3	7.0	m3	0	0
		Borrowing & reclamation	\$/m3	6.7	m3	3,056,200	20,476,540
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m	0	0
		(2)±0.0--5.0	\$/m	3,679	m	90	331,110
		(3)-5.0--10.0	\$/m	6,946	m	30	208,380
		(4)-10.0-15.0	\$/m	14,777	m	20	295,540
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	770	42,858,200
		(5)-14.0m	\$/m	56,880	m	965	54,889,200
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
Existing Pier upgrading	\$/m2	1,674	m2				
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set				
	Subtotal					122,615,170	

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
C	On-land works	Soil improvement	\$/ha	625,000	ha	3.07	1,918,750	
		Inner access	\$/m2	67.7	m2	24,600	1,665,420	
		Back apron	\$/m2	-	m2	-	-	
		Side apron	\$/m2	-	m2	-	-	
		Pavement (1) Gravel pave.	\$/m2	-	m2	-	-	
		(2) Light pave.	\$/m2	67.7	m2	140,160	9,488,832	
		(3) Normal pave.	\$/m2	96.8	m2	93,440	9,044,992	
		(4) Heavy pave. C2	\$/m2	-	m2	-	-	
		(5) Heavy pave. C3	\$/m2	-	m2	-	-	
		Storm water drainage	\$/ha	36,000	ha	25.34	912,240	
		Flyover	\$/m2	2,500	m2	-	-	
Sub-total						23,030,234		
D	Building	Main Gate	\$/m2	413	m2	1,000	413,000	
		Control house	\$/m2	722	m2	1,000	722,000	
		Maintenance shops	\$/m2	748	m2	0	0	
		CFS. WH. TS	\$/m2	528	m2	40,200	21,225,600	
		Substation/Power station	\$/m2	581	m2	500	290,500	
		Passenger terminal	\$/m2	-	m2	-	-	
		Misc., building	\$/m2	442	m2	2,000	884,000	
		Weigh bridge	\$/set	57,041	set	1	57,041	
		Over-head passenger bridge	\$/m	-	m	-	-	
		Fence	\$/m	106.5	m	1,700	181,050	
		Park	\$/m2	11.4	m2	6,200	70,680	
		Landscaping	\$/m2	35.0	m2	2,060	72,100	
		Subtotal						23,915,971
		E	Utilities	Water supply (yard main)	\$/B	63,225	B	6
Water supply (dis.)	\$/ha			13,579	ha	25.34	344,092	
Fire fighting lines	\$/ha			1,500	ha	25.34	38,010	
Fire fighting car	\$/set			200,000	set	1	200,000	
Sewerage	\$/ha			2,813	ha	25.34	71,281	
Power supply (Distr.)	\$/B			352,500	B	3.0	1,057,500	
Power supply (P.Plant)	\$/B			182,900	B	3	548,700	
Power supply (W.crane)	\$/B			152,000	B	2	304,000	
Lighting (yard)	\$/B			112,000	B	6	672,000	
Lighting (road)	\$/ha			24,000	ha	6.15	147,600	
Telecommunication	\$/ha			4,000	ha	25.34	101,240	
Reefer system	\$/B			33,000	B	2	66,000	
Bunker system	\$/m			1,000	m	1,245	1,245,000	
Misc., utilities	\$/LS			300,000	LS	1	300,000	
Subtotal						5,474,773		

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
F	Supplemental works	Demolishing and Removal						
		Demolishing (Trestle)						
			\$/m2	150	m2	14,770	2,215,500	
		Demolishing (Dolphins)						
			\$/m2	400	m2	4,400	1,760,000	
		Demolishing (wharf)						
			\$/m2	200	m2	0	0	
		Demolishing (jetty)						
			\$/m2	100	m2	34,000	3,400,000	
		Demolishing (building)						
			\$/m2	50	m2		0	
Demolishing (onland civil)								
	\$/m2	50	m2	16,500	825,000			
Removal (building)								
	\$/m2	200.0	m2	24,100	4,820,000			
Removal (piles)								
	s/pile	500.0	piles	400	200,000			
Environmental protection								
			LS	-	-			
Misc. works								
			LS	1	0			
Sub-total								
					13,220,500			
G	Others	Item (1) Rail tracks						
			\$/m	1,000.0	m	6,000	6,000,000	
		Item (2)						
			LS		set			
		Item (3)						
	LS		set					
Sub-total								
					6,000,000			
Total A to G								
					203,319,148			

Imam Khomeini Port Estimation: Summary

Existing Facility Upgrading for Plan 1 or Plan 2, (LTD)

Zone 2, Former Ten Berth Extension Areas

(1/4)

Work Category		Works		Unit Rate		Works		Cost US\$
				Unit		Unit		
A	General Works							1,718,750
B	Marine Works							11,132,000
C	On-land Works							9,348,598
D	Building							27,010,012
E	Utilities							4,811,167
F	Supplemental Works							780,000
G	Others							1,000,000
H	Subtotal (A-G)							55,800,527
I	Contingency	Physical (10% of G)						
J	Engineering	(10% of G)						
K	Total	H+I+J						
<u>Land Use Plan</u>								
	Total Area	97.43 ha	100%					
	Wharf apron	11.44 ha	11.73					
	Inner access (Ex)	8.63 ha	8.85					
	" (Nw)	3.23 ha	3.32					
	Yard pavement (Ex)	49.20 ha	50.50					
	" (Nw)	9.24 ha	9.48					
	Building (Ex)	7.28 ha	7.47					
	" (Nw)	4.75 ha	4.88					
	Common areas (Ex)	1.00 ha	1.03					
	" (Nw)	1.00 ha	1.03					
	Parks	0.97 ha	1.00					
	Reserves	0.69 ha	0.71					

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	0.25	531,250
		Site Common Works	\$/unit	2,375,000	unit	0.50	1,187,500
		Subtotal					1,718,750
B	Marine Works	Seabed Clearance	\$/B	13,500	B		
		Dredging & reclamation (N)	\$/m3	3.0	m3		
		Dredging & reclamation (H)	\$/m3	6.0	m3		
		Dredging & reclamation (R)	\$/m3	48.0	m3		
		Dredging & disposal (N)	\$/m3	4.0	m3		
		Dredging & disposal (H)	\$/m3	7.0	m3		
		Borrowing & reclamation	\$/m3	6.7	m3		
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m		
		(2)±0.0--5.0	\$/m	3,679	m		
		(3)-5.0--10.0	\$/m	6,946	m		
		(4)-10.0-15.0	\$/m	14,777	m		
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	200	11,132,000
		(5)-14.0m	\$/m	56,880	m		
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
Existing Pier upgrading	\$/m2	1,674	m2				
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set				
	Subtotal					11,132,000	

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
C	On-land works	Soil improvement	\$/ha	625,000	ha	0	0
		Inner access	\$/m2	67.7	m2	32,300	2,186,710
		Back apron	\$/m2	-	m2	-	-
		Side apron	\$/m2	-	m2	-	-
		Pavement (1) Gravel pave.	\$/m2	-	m2	0	0
		(2) Light pave.	\$/m2	67.7	m2	73,920	5,004,384
		(3) Normal pave.	\$/m2	96.8	m2	18,480	1,788,864
		(4) Heavy pave. C2	\$/m2	-	m2	-	-
		(5) Heavy pave. C3	\$/m2	-	m2	-	-
		Storm water drainage	\$/ha	36,000	ha	10.24	368,640
		Flyover	\$/m2	2,500	m2	-	-
		Sub-total					9,348,598
		D	Building	Main Gate	\$/m2	413	m2
Control house	\$/m2			722	m2	4,000	2,888,000
Maintenance shops	\$/m2			748	m2	4,000	2,992,000
CFS. WH. TS	\$/m2			528	m2	35,700	18,849,600
Substation/Power station	\$/m2			581	m2	500	290,500
Passenger terminal	\$/m2			-	m2	-	-
Misc., building	\$/m2			442	m2	2,300	1,016,600
Weigh bridge	\$/set			57,041	set	2	114,082
Over-head passenger bridge	\$/m			-	m	-	-
Fence	\$/m			106.5	m	2,100	223,650
Park	\$/m2			11.4	m2	9,700	110,580
Landscaping	\$/m2			35.0	m2	3,200	112,000
Subtotal							27,010,012
E	Utilities	Water supply (yard main)	\$/B	63,225	B	8	505,800
		Water supply (dis.)	\$/ha	13,579	ha	10.24	276,722
		Fire fighting lines	\$/ha	1,500	ha	10.24	15,360
		Fire fighting car	\$/set	200,000	set	1	200,000
		Sewerage	\$/ha	2,813	ha	10.24	28,805
		Power supply (Distr.)	\$/B	352,500	B	3	1,057,500
		Power supply (P.plan)	\$/B	182,900	B	3	548,700
		Power supply (W.crane)	\$/B	152,000	B	3	456,000
		Lighting (yard)	\$/B	112,000	B	8	896,000
		Lighting (road)	\$/ha	24,000	ha	11.93	286,320
		Telecommunication	\$/ha	4,000	ha	10.24	40,960
		Reefer system	\$/B	33,000	B	3	99,000
		Bunker system	\$/m	1,000	m	100	100,000
		Misc., utilities	\$/LS	300,000	LS	1	300,000
Subtotal					4,811,167		

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
F	Supplemental works	Demolishing and Removal					
		Demolishing (Trestle)	\$/m2	150	m2	0	0
		Demolishing (Dolphins)	\$/m2	400	m2	0	0
		Demolishing (wharf)	\$/m2	200	m2	0	0
		Demolishing (jetty)	\$/m2	100	m2	0	0
		Demolishing (building)	\$/m2	50	m2	2,000	100,000
		Demolishing (onland civil)	\$/m2	50	m2	10,000	500,000
		Removal (building)	\$/m2	200.0	m2	900	180,000
		Removal (piles)	s/pile	500.0	piles	0	0
		Environmental protection			LS	--	--
		Misc. works			LS	1	0
			Sub-total				
G	Others	Item (1) Rail tracks	\$/m	1,000.0	m	1,000	1,000,000
		Item (2)	LS		set		
		Item (3)	LS		set		
		Sub-total					1,000,000
	Total A to G					55,800,527	

Imam Khomeini Port Estimation: Summary

Existing Facility Upgrading for Plan 1, Plan 2 or Plan 3, (LTD)

Zone 3, Former Fourteen Berth Extension Areas

(1/4)

Work Category	Works	Unit Rate		Works		Cost
		Unit		Unit		US\$
A	General Works					0
B	Marine Works					0
C	On-land Works					0
D	Building					615,000
E	Utilities					0
F	Supplemental Works					1,800,000
G	Others					0
H	Subtotal (A-G)					2,415,000
I	Contingency		Physical (10% of G)			
J	Engineering		(10% of G)			
K	Total		H+I+J			
<u>Land Use Plan</u>						
	Total Area	ha	100%			
	Wharf apron	ha				
	Inner access (Ex)	ha				
	" (Nw)	ha				
	Yard pavement (Ex)	ha				
	" (Nw)	ha				
	Building (Ex)	ha				
	" (Nw)	ha				
	Common areas (Ex)	ha				
	" (Nw)	ha				
	Parks	ha				
	Reserves	ha				

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit		
		Site Common Works	\$/unit	2,375,000	unit		
		Subtotal					0
B	Marine Works	Seabed Clearance	\$/B	13,500	B		
		Dredging & reclamation (N)	\$/m3	3.0	m3		
		Dredging & reclamation (H)	\$/m3	6.0	m3		
		Dredging & reclamation (R)	\$/m3	48.0	m3		
		Dredging & disposal (N)	\$/m3	4.0	m3		
		Dredging & disposal (H)	\$/m3	7.0	m3		
		Borrowing & reclamation	\$/m3	6.7	m3		
		Scawall (1)+7.5m-±0.0m	\$/m	2,168	m		
		(2)±0.0--5.0	\$/m	3,679	m		
		(3)-5.0--10.0	\$/m	6,946	m		
		(4)-10.0-15.0	\$/m	14,777	m		
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m		
		(5)-14.0m	\$/m	56,880	m		
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2		
		Existing Jetty upgrading	\$/m2	1,922	m2		
		Existing Pier upgrading	\$/m2	1,674	m2		
		Ro-Ro system	LS		set		
		Breakwater	\$/m		m		
		Navigation aid	LS	5,000,000	set		
	Subtotal					0	

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
C	On-land works	Soil improvement	\$/ha	625,000	ha			
		Inner access	\$/m2	67.7	m2			
		Back apron	\$/m2	-	m2			
		Side apron	\$/m2	-	m2			
		Pavement	(1) Gravel pave.	\$/m2		m2		
			(2) Light pave.	\$/m2	67.7	m2		
			(3) Normal pave.	\$/m2	96.8	m2		
			(4) Heavy pave. C2	\$/m2		m2		
			(5) Heavy pave. C3	\$/m2		m2		
		Storm water drainage	\$/ha	36,000	ha			
		Flyover	\$/m2	2,500	m2			
Sub-total						0		
D	Building	Main Gate	\$/m2	413	m2			
		Control house	\$/m2	722	m2			
		Maintenance shops	\$/m2	748	m2			
		CFS. WH. TS	\$/m2	528	m2		0	
		Substation/Power station	\$/m2	581	m2			
		Passenger terminal	\$/m2	-	m2			
		Misc., building	\$/m2	442	m2	1,000	442,000	
		Weigh bridge	\$/set	57,041	set			
		Over-head passenger bridge	\$/m	-	m			
		Fence	\$/m	106.5	m			
		Park	\$/m2	11.4	m2	7,500	85,500	
		Landscaping	\$/m2	35.0	m2	2,500	87,500	
		Subtotal						615,000
		E	Utilities	Water supply (yard main)	\$/B	63,225	B	
Water supply (dis.)	\$/ha			13,579	ha			
Fire fighting lines	\$/ha			1,500	ha			
Fire fighting car	\$/set			200,000	set			
Sewerage	\$/ha			2,813	ha			
Power supply (Distr.)	\$/B			352,500	B			
Power supply (P.plan)	\$/B			182,900	B			
Power supply (W.crane)	\$/B			152,000	B			
Lighting (yard)	\$/B			112,000	B			
Lighting (road)	\$/ha			24,000	ha			
Telecommunication	\$/ha			4,000	ha			
Reefer system	\$/B			33,000	B			
Bunker system	\$/m			1,000	m			
Misc., utilities	\$/LS			300,000	LS			
Subtotal						0		

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
F	Supplemental works	Demolishing and Removal					
		Demolishing (Trestle)	\$/m2	150	m2		
		Demolishing (Dolphins)	\$/m2	400	m2		
		Demolishing (wharf)	\$/m2	200	m2		
		Demolishing (jetty)	\$/m2	100	m2		
		Demolishing (building)	\$/m2	50	m2		
		Demolishing (onland civil)	\$/m2	50	m2		
		Removal (building)	\$/m2	200.0	m2	9,000	1,800,000
		Removal (piles)	s/pile	500.0	piles		
		Environmental protection			LS		
		Misc. works			LS	1	0
	Sub-total					1,800,000	
G	Others	Item (1) Rail tracks	\$/m	1,000.0	m	0	0
		Item (2)	LS		set		
		Item (3)	LS		set		
		Sub-total					0
	Total A to G					2,415,000	

Imam Khomeini Port Estimation: Summary

Existing Facility Upgrading for Plan 3, (LTD)

Zone 1, Old port and Former Four Berth Extension Areas

(1/4)

Work Category	Works	Unit Rate		Works		Cost US\$
		Unit		Unit		
A	General Works					5,687,500
B	Marine Works					50,445,340
C	On-land Works					9,381,485
D	Building					10,569,470
E	Utilities					2,429,180
F	Supplemental Works					1,762,500
G	Others					2,100,000
H	Subtotal (A-G)					82,375,475
I	Contingency	Physical (10% of G)				
J	Engineering	(10% of G)				
K	Total	H+I+J				
<u>Land Use Plan</u>				<u>Dredging 1,522,000 m3</u>		
Total Area	37.70\ ha	100%		Soft (disposal)	1,522 x 0.20 =	<u>304,400 m3</u>
Wharf apron	5.78\ ha	15.33		Normal	1,522 x 0.40 =	608,800 m3
Inner access (Ex)	3.21\ ha	8.50		Hard	1,522 x 0.40 =	608,800 m3
" (Nw)	3.20\ ha	8.50		Hard (disposal)		353,600 m3
Yard pavement (Ex)	9.50\ ha	23.20				
" (Nw)	2.51\ ha	6.67				
Building (Ex)	0.60\ ha	1.59		<u>Reclamation 691,000 m3</u>		
" (Nw)	1.72\ ha	4.56		Required volume		
Common areas (Ex)	0.00\ ha	0.00		691,000 ÷ 0.80 = 864,000 m3		
" (Nw)	4.50\ ha	11.94		By Normal	<u>608.800</u> m3	
Parks	0.38\ ha	1.00		By Hard	<u>255.200</u> m3	
Reserves	6.30\ ha	16.71				

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	1	2,125,000
		Site Common Works	\$/unit	2,375,000	unit	1.5	3,562,500
		Subtotal					5,687,500
B	Marine Works	Seabed Clearance	\$/B	13,500	B	4	54,000
		Dredging & reclamation (N)	\$/m3	3.0	m3	608,800	1,826,400
		Dredging & reclamation (H)	\$/m3	6.0	m3	255,200	1,531,200
		Dredging & reclamation (R)	\$/m3	48.0	m3	0	0
		Dredging & disposal (N)	\$/m3	4.0	m3	304,400	1,217,600
		Dredging & disposal (H)	\$/m3	7.0	m3	353,600	2,475,200
		Borrowing & reclamation	\$/m3	6.7	m3	0	0
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m	0	0
		(2)±0.0--5.0	\$/m	3,679	m	140	515,060
		(3)-5.0--10.0	\$/m	6,946	m	20	138,920
		(4)-10.0-15.0	\$/m	14,777	m	80	1,182,160
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m		
		(5)-14.0m	\$/m	56,880	m		
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2	50,000	32,800,000
Existing Jetty upgrading	\$/m2	1,922	m2				
Existing Pier upgrading	\$/m2	1,674	m2	5,200	8,704,800		
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set				
	Subtotal					50,445,340	

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
C	On-land works	Soil improvement	\$/ha	625,000	ha	5.40	3,375,000
		Inner access	\$/m2	67.7	m2	32,000	2,166,400
		Back apron	\$/m2	-	m2	-	
		Side apron	\$/m2	-	m2	-	
		Pavement (1) Gravel pave.	\$/m2		m2		
		(2) Light pave.	\$/m2	67.7	m2	35,050	2,372,885
		(3) Normal pave.	\$/m2	96.8	m2	12,550	1,214,840
		(4) Heavy pave. C2	\$/m2		m2		
		(5) Heavy pave. C3	\$/m2		m2		
		Storm water drainage	\$/ha	36,000	ha	7.01	252,360
		Flyover	\$/m2	2,500	m2		
		Sub-total					9,381,485
		D	Building	Main Gate	\$/m2	413	m2
Control house	\$/m2			722	m2		
Maintenance shops	\$/m2			748	m2		
CFS. WH. TS	\$/m2			528	m2	18,000	9,504,000
Substation/Power station	\$/m2			581	m2		
Passenger terminal	\$/m2			-	m2	-	
Misc., building	\$/m2			442	m2	1,800	795,600
Weigh bridge	\$/set			57,041	set		
Over-head passenger bridge	\$/m			-	m	-	
Fence	\$/m			106.5	m	1,700	181,050
Park	\$/m2			11.4	m2	3,800	43,320
Landscaping	\$/m2			35.0	m2	1,300	45,500
Subtotal							10,569,470
E	Utilities			Water supply (yard main)	\$/B	63,225	B
		Water supply (dis.)	\$/ha	13,579	ha	26.39	358,350
		Fire fighting lines	\$/ha	1,500	ha	26.39	39,585
		Fire fighting car	\$/set	200,000	set	0	0
		Sewerage	\$/ha	2,813	ha	26.39	74,235
		Power supply (Distr.)	\$/B	352,500	B	1	352,500
		Power supply (P.plan)	\$/B	182,900	B	1	182,900
		Power supply (W.crane)	\$/B	152,000	B	0	0
		Lighting (yard)	\$/B	112,000	B	3	336,000
		Lighting (road)	\$/ha	24,000	ha	6.40	153,600
		Telecommunication	\$/ha	4,000	ha	26.39	105,560
		Reefer system	\$/B	33,000	B	0	0
		Bunker system	\$/m	1,000	m	400	400,000
		Misc., utilities	\$/LS	300,000	LS	1	300,000
		Subtotal					2,429,180

Work Category		Works	Unit Rate		Works		Cost
			Unit		Unit		US\$
F	Supplemental works	Demolishing and Removal					
		Demolishing (Trestle)	\$/m2	150	m2	450	67,500
		Demolishing (Dolphins)	\$/m2	400	m2	0	0
		Demolishing (wharf)	\$/m2	200	m2	0	0
		Demolishing (jetty)	\$/m2	100	m2	1,200	120,000
		Demolishing (building)	\$/m2	50	m2		
		Demolishing (onland civil)	\$/m2	50	m2	7,500	375,000
		Removal (building)	\$/m2	200.0	m2	4,500	900,000
		Removal (piles)	s/pile	500.0	piles	600	300,000
		Environmental protection			LS	-	-
		Misc. works			LS	1	0
			Sub-total				
G	Others	Item (1) Rail tracks	\$/m	1,000.0	m	2,100	2,100,000
		Item (2)	LS		set		
		Item (3)	LS		set		
		Sub-total					2,100,000
	Total	A to G				82,375,475	

Imam Khomeini Port Estimation: Summary

Existing Facility Upgrading for Plan 3, (LTD)

Zone 2, Former Ten Berth Extension Areas

(1/4)

Work Category		Works		Unit Rate		Works		Cost US\$
				Unit		Unit		
A	General Works							1,718,750
B	Marine Works							7,557,900
C	On-land Works							10,781,492
D	Building							30,903,125
E	Utilities							5,484,947
F	Supplemental Works							11,300,000
G	Others							1,400,000
H	Subtotal (A-G)							69,146,214
I	Contingency	Physical (10% of G)						
J	Engineering	(10% of G)						
K	Total	H+I+J						
<u>Land Use Plan</u>								
	Total Area	93.26 ha	100%					
	Wharf apron	11.47 ha	12.30					
	Inner access (Ex)	7.93 ha	8.50					
	" (Nw)	3.27 ha	3.50					
	Yard pavement (Ex)	48.65 ha	52.17					
	" (Nw)	9.33 ha	10.00					
	Building (Ex)	2.78 ha	2.98					
	" (Nw)	5.90 ha	6.33					
	Common areas (Ex)	1.00 ha	1.07					
	" (Nw)	1.00 ha	1.07					
	Parks	0.93 ha	1.00					
	Reserves	1.00 ha	1.08					

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
A	General Works	Mobilization/Demobilization	\$/unit	2,125,000	unit	0.25	531,250
		Site Common Works	\$/unit	2,375,000	unit	0.50	1,187,500
		Subtotal					1,718,750
B	Marine Works	Seabed Clearance	\$/B	13,500	B		
		Dredging & reclamation (N)	\$/m3	3.0	m3		
		Dredging & reclamation (H)	\$/m3	6.0	m3		
		Dredging & reclamation (R)	\$/m3	48.0	m3		
		Dredging & disposal (N)	\$/m3	4.0	m3		
		Dredging & disposal (H)	\$/m3	7.0	m3		
		Borrowing & reclamation	\$/m3	6.7	m3		
		Seawall (1)+7.5m-±0.0m	\$/m	2,168	m		
		(2)±0.0--5.0	\$/m	3,679	m		
		(3)-5.0--10.0	\$/m	6,946	m		
		(4)-10.0-15.0	\$/m	14,777	m		
		Wharf (1)-10.0m	\$/m	52,000	m		
		(2)-11.0m	\$/m	53,220	m		
		(3)-12.0m	\$/m	54,440	m		
		(4)-13.0m	\$/m	55,660	m	25	1,391,500
		(5)-14.0m	\$/m	56,880	m		
		(6)-14.0m, Container	\$/m	59,700	m		
		Existing Wharf upgrading					
		(1)-11m to -12m	\$/m	15,113	m		
		(2)-11m to -13m	\$/m	18,323	m		
		(3)-11m to -14m	\$/m	22,143	m		
		(4)Wide deck	\$/m2	656	m2	9,400	6,166,400
		Existing Jetty upgrading	\$/m2	1,922	m2		
Existing Pier upgrading	\$/m2	1,674	m2				
Ro-Ro system	LS		set				
Breakwater	\$/m		m				
Navigation aid	LS	5,000,000	set				
	Subtotal					7,557,900	

Work Category	Works	Unit Rate		Works		Cost	
		Unit		Unit		US\$	
C	On-land works	Soil improvement	\$/ha	625,000	ha	0	0
		Inner access	\$/m2	67.7	m2	32,700	2,213,790
		Back apron	\$/m2	-	m2	-	-
		Side apron	\$/m2	-	m2	-	-
		Pavement (1) Gravel pave.	\$/m2	-	m2	-	-
		(2) Light pave.	\$/m2	67.7	m2	61,980	4,196,046
		(3) Normal pave.	\$/m2	96.8	m2	41,320	3,999,776
		(4) Heavy pave. C2	\$/m2	-	m2	-	-
		(5) Heavy pave. C3	\$/m2	-	m2	-	-
		Storm water drainage	\$/ha	36,000	ha	10.33	371,880
		Flyover	\$/m2	2,500	m2	-	-
Sub-total					10,781,492		
D	Building	Main Gate	\$/m2	413	m2	1,000	413,000
		Control house	\$/m2	722	m2	4,000	2,888,000
		Maintenance shops	\$/m2	748	m2	4,000	2,992,000
		CFS. WH. TS	\$/m2	528	m2	42,000	22,176,000
		Substation/Power station	\$/m2	581	m2	500	290,500
		Passenger terminal	\$/m2	-	m2	-	-
		Misc., building	\$/m2	442	m2	2,900	1,281,800
		Weigh bridge	\$/set	57,041	set	5	285,205
		Over-head passenger bridge	\$/m	-	m	-	-
		Fence	\$/m	106.5	m	3,400	362,100
		Park	\$/m2	11.4	m2	9,300	106,020
		Landscaping	\$/m2	35.0	m2	3,100	108,500
		Subtotal					30,903,125
E	Utilities	Water supply (yard main)	\$/B	63,225	B	7	442,575
		Water supply (dis.)	\$/ha	13,579	ha	37.30	506,497
		Fire fighting lines	\$/ha	1,500	ha	37.30	55,950
		Fire fighting car	\$/set	200,000	set	1	200,000
		Sewerage	\$/ha	2,813	ha	37.30	104,925
		Power supply (Distr.)	\$/B	352,500	B	3	1,057,500
		Power supply (P.plan)	\$/B	182,900	B	5	914,500
		Power supply (W.crane)	\$/B	152,000	B	5	760,000
		Lighting (yard)	\$/B	112,000	B	5	560,000
		Lighting (road)	\$/ha	24,000	ha	11.20	268,800
		Telecommunication	\$/ha	4,000	ha	37.30	149,200
		Reefer system	\$/B	33,000	B	5	165,000
		Bunker system	\$/m	1,000	m	0	0
		Misc., utilities	\$/LS	300,000	LS	1	300,000
Subtotal					5,484,947		

Work Category		Works	Unit Rate		Works		Cost	
			Unit		Unit		US\$	
F	Supplemental works	Demolishing and Removal						
		Demolishing (Trestle)	\$/m2	150	m2			
		Demolishing (Dolphins)	\$/m2	400	m2			
		Demolishing (wharf)	\$/m2	200	m2			
		Demolishing (jetty)	\$/m2	100	m2			
		Demolishing (building)	\$/m2	50	m2			
		Demolishing (onland civil)	\$/m2	50	m2	10,000	500,000	
		Removal (building)	\$/m2	200.0	m2	54,000	10,800,000	
		Removal (piles)	s/pile	500.0	piles			
		Environmental protection			LS		—	
		Misc. works			LS	1	0	
			Sub-total					11,300,000
G	Others	Item (1) Rail tracks	\$/m	1,000.0	m	1,400	1,400,000	
		Item (2)	LS		set			
		Item (3)	LS		set			
		Sub-total					1,400,000	
	Total A to G					69,146,214		

